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# The Research Quarterly

of the

## American Physical Education Association

VOL. VII OCTOBER, 1936

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Book Reviews

Published March, May, October, and December

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*of the*

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**Vol. VII** **OCTOBER, 1936** **No. 3**

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# The Status of Physical Education for Women in Colleges and Universities

By VIOLET B. MARSHALL

*Director, Department of Physical Education for Women*
*University of California, Berkeley*

DURING the last few years, rapid change and extensive experiment have taken place throughout the field of liberal education in colleges and universities.* The changes have occurred primarily in educational policies but have often been influenced to a marked extent by the necessity for reduction in expenses. The chief tendency seems to be toward greater flexibility of curriculum with increased recognition of individual differences and desires of students.

It is not strange that the status of physical education should have been scrutinized in several colleges, nor, under the influences mentioned above, that some changes should have resulted. Whether or not the radical change of elimination of a requirement in physical education represents progress cannot as yet be fairly estimated.

In October, 1934, the National Association of Directors of Physical Education for College Women published a report entitled "A Discussion of the Requirement in Physical Education for Women in Colleges and Universities." [1] In March, 1936, the same committee which had prepared the earlier report made a supplementary study of "The Status of Physical Education for Women in Colleges and Universities" which is herewith submitted. The 1936 survey is somewhat broader in scope than that of 1934, since the current study covers all matters of credit and changes in the status of physical education in addition to a consideration of the requirement itself.

A strong argument can be made both for and against a college requirement in physical education. An argument in favor of a requirement was set forth in the report of this committee published in 1934. In order that informed thinking may take place on this subject, an

---

*This paper was presented at the biennial meeting of the National Association of Directors of Physical Education for College Women in St. Louis, Missouri, April 14, 1936, as the special research study which had been undertaken by the Western Society of Departments of Physical Education for College Women.

The chairman of the committee wishes to express appreciation to all who cooperated in the study, particularly to three members of her staff: Miss Sarah Davis, Miss Louise Cobb, and especially to Miss Anna Espenschade, who compiled the statistical results.

[1] Violet B. Marshall, "A Discussion of the Requirement in Physical Education for Women in Colleges and Universities," RESEARCH QUARTERLY, V: 4 (Dec., 1934), p. 3.

argument for a wholly elective plan should also be prepared. This is not the occasion, however, to enumerate or discuss the points in such an argument, but mention will be made of certain implications.

The educational philosophy of the times favors, in general, fewer restrictions and requirements, a wider range of election and greater freedom, with correspondingly increased responsibility on the part of the student. The objectives of education, it is assumed, are to be secured less through regulation and more through effective guidance. It is indeed desirable that college students should develop maturity and a greater power of intelligent self-direction. It seems possible that a necessity for assuming some responsibility for the planning of their courses will assist students to become more thoughtful and responsible in such matters.

In 1932 no one could predict with accuracy what would be the result in any given institution of the elimination of all requirements in physical education. Where the change has been made, it is interesting to observe the experiment in progress.

In the University of California, for example, under the elective plan it seems to be very much "the thing to do" to elect physical education. Is it not to be expected that the student who has made her own decision in college that physical education is necessary or desirable in her program is likely to maintain the same point of view in the years after college and to seek opportunities for regular activity? When the decision concerning participation is made by college authorities, the student may fulfill the requirement with little thinking on her own part as to the real values involved. When her requirements are completed she often experiences a feeling of release which is not conducive to attracting her again to the department program, as statistics in these matters have revealed all too clearly.

A subject of absorbing interest and active discussion in student groups, especially at the beginning of each term, centers around their questioning of themselves and one another, "Shall we take this course? Shall we take that?" These discussions may yield fruitful results in making students at least think and talk about the values of physical education and of specific courses within the field. If it can become increasingly "the thing to do" to participate regularly in physical activity through individual choice, there should develop a greater awareness of values involved than when the question is never even raised in the individual student's mind.

The changes which have recently taken place in the status of physical education in colleges should be studied as experiments, and all pertinent data in regard to them should be carefully assembled. At the same time care must be taken to avoid superficial interpretation of these data. Conclusions might be drawn which would not only be premature, but possibly influenced by preconceptions or prejudices which

would invalidate them. An attempt has been made here, therefore, simply to present the facts in the recent history of college physical education for women in certain respects.

A questionnaire (Appendix, p. 6) was sent in March, 1936 to the 220 member institutions represented in the National Association. At the time that the results were compiled, 154 questionnaires, or 70.6 per cent, had been returned. The information secured was analyzed on the basis of the four main geographical divisions of the country: east, south, midwest, west, and also as to three types of institutions: universities and liberal arts colleges, teachers' colleges, and junior colleges.

## THE REQUIREMENT

Physical education is required in over 95 per cent of the institutions which answered this questionnaire. In 1934 five institutions had reported that the requirement had been eliminated: the University of California, Berkeley; the University of Chicago; the University of Kansas; the College of Science, Letters, and Arts of the University of Minnesota; and Scripps College. In 1936 three additional institutions report the elimination of the requirement: Goucher College, Joliet Junior College, and Sarah Lawrence College.

Of the 95 per cent of institutions which require physical education, over half require physical education for two years, twice a week. In the east, south, and west, physical education is in many cases required for three and for four years. In all parts of the country, physical education is often required three times a week.

About three-quarters of the institutions represented have department requirements of specific activities. Rhythmic activities and sports are the most common requirements. Gymnastics is required by about one-third. Courses in hygiene and orientation are also required by some schools.

Fewer than half of the departments require any specific requirement in skills. Many have a specific swimming requirement but no other standards of achievement are set. Some comments were made to the effect that specific achievements would be required if satisfactory measurement of achievement were possible.

## CREDIT

More than three-quarters of the colleges and universities give credit for physical education activity courses. In most cases this credit is made academically acceptable by requiring a larger number of units for the degree. For example, the majority of schools allow four units in physical education and require 124 units for the degree. Other schools allow physical education no credit but require only 120 units for the degree. In a few cases, however, credit is given for physical education courses and the total number of units required for the degree is not increased.

## CHANGES IN STATUS

*Time Requirements.*—In 1934 two institutions, the Universities of Michigan and of Wisconsin, had reduced the requirement. In 1936 eight institutions report that the time requirement has been reduced, and five that it has been increased. If colleges which have eliminated all requirements are included, then there are three times as many schools which have reduced the time requirement as there are which have increased it (15 to 5). There seems to be no particular type of school or part of the country, however, which is showing any distinct trend in either direction.

*Credit.*—There is evidence of some change in credit for physical education. In general, there seems to be a slight increase in the number of schools giving academic credit, especially in the South. Nine institutions report that the amount of credit has been increased; two that it has been reduced.

*Grading.*—Three institutions report that the basis of grading has been changed from letter grades to *passed* or *not passed*. Whether this change was made for physical education only or for all subjects was not stated.

It is significant that more than one-fifth of the institutions report changes in time or credit requirements. Other changes indicate greater freedom of choice of activity and in general a more liberal attitude toward the inclusion of recreational activities and coeducational sports. Whether these changes represent educational progress or loss of ground already gained depends on the point of view and on the entire educational philosophy involved.

## APPENDIX

### Copy of the Questionnaire

I. Is physical education required? Yes. No. (Underline)

If your answer is yes, please give additional information as follows:

a. Time: years: ..... terms: .....
Number of times per week: .....

b. Are specific activities or types of activity required? Yes. No. (Underline)
By the College, or by the Department? (Underline)

Specify: Rhythms .....
Sports .....
Gymnastics .....
Others .....

c. Are specific achievements in skills required? Yes. No. (Underline)
By the College for the degree, or by the Department? (Underline)

*e. g.* Swimming.
Specify: .....

Notes: (Use other side if necessary)

II. Is physical education elective? Yes. No. (Underline)

If your answer is yes, please give additional information as follows:

Unlimited (absolutely free choice by student) .....
Limited: by recommendation of examiners of physical condition .....
by college year .....
by types of work .....

Notes: (Use other side if necessary)

III. Do physical education activity courses receive credit? Yes. No. (Underline)
Total number of units of all courses required for the college degree: .....
Total number of units of physical education activity courses obtainable: .....
Number which may be counted toward the bachelor's degree: .....
Is physical education required without credit for the degree? Yes. No. (Underline)

IV. Changes in the status of physical education since September, 1932.
Describe: (use other side if necessary)
Discuss reasons:
Discuss results of changes:

SUPPLEMENTARY DATA ON THE STATUS OF PHYSICAL EDUCATION FOR WOMEN IN COLLEGES AND UNIVERSITIES (QUESTIONNAIRE—MARCH, 1936)

No. of questionnaires sent out: 220
No. of questionnaires returned: 154, or 70.6 per cent
Replies were received as follows:

| | From Universities and Liberal Arts Colleges | From Teachers' Colleges | From Junior Colleges |
|---|---|---|---|
| East | 31 | 0 | 1 |
| South | 23 | 4 | 0 |
| Midwest | 43 | 14 | 3 |
| West | 23 | 8 | 4 |
| Total | 120 | 26 | 8 |

Of the replies received, only a limited number answered all questions. All replies received have been included in the tabulations.

The data below indicate the most common replies in the order given on the questionnaire issued.

I. Is physical education required? Yes (95.4%).

*a*) Time: Years: 2 (60.4%).
Number of times per week: 2 (52.2%).

*b*) Are specific activities or types of activity required? Yes (70.6%).
By the department, 93%.
Rhythms, 82.1%; Sports, 81.1%; Gymnastics; 39.6%; Others, 22.7%.

*c*) Are specific achievements in skills required? No (53.2%).

II. Is physical education elective? Yes (4.6%).
Limited by recommendation of examiners of physical condition, 100%.

III. Do physical education activity courses receive credit? Yes (77.5%).
Total number of units required for the college degree: 124 (61.0%).
Total number of units of physical education activity courses obtainable: 4 (33%). No specific number given by a majority.
Number which may be counted toward the bachelor's degree: 4 (42.6%). No specific number given by a majority.

IV. Changes in the status of physical education since September, 1932: None (77.3%).

## ANALYSIS OF DATA

UNIVERSITIES AND LIBERAL ARTS COLLEGES

| | East | South | Mid-west | West | Total | Per Cent |
|---|---|---|---|---|---|---|
| **I. Is physical education required?** | | | | | | |
| Yes | 29 | 23 | 42 | 21 | 115 | 95.8 |
| No | 2 | | 1 | 2 | 5 | 04.2 |
| *a*) Time—Years | | | | | | |
| 1. | 1 | | 5 | | 6 | 05.4 |
| 2. | 11 | 12 | 33 | 8 | 64 | 58.2 |
| 3. | 8 | 8 | 3 | 1 | 20 | 18.2 |
| 4. | 9 | 2 | 1 | 8 | 20 | 18.2 |
| Periods per week | | | | | | |
| 1. | | 1 | | | 1 | 00.9 |
| 2. | 14 | 8 | 18 | 13 | 53 | 50.0 |
| 3. | 10 | 13 | 25 | 4 | 52 | 49.1 |
| 4. | | | | | | |
| *b*) Specific activity required | | | | | | |
| Yes | 22 | 18 | 27 | 13 | 80 | 61.7 |
| No | 7 | 4 | 15 | 6 | 32 | 38.3 |
| By College | | | 2 | | 2 | 02.5 |
| By Department | 20 | 17 | 27 | 13 | 77 | 97.5 |
| Rhythms | 18 | 16 | 22 | 10 | 66 | |
| Sports | 15 | 17 | 20 | 12 | 64 | |
| Gymnastics | 13 | 10 | 9 | 2 | 34 | |
| Others | 5 | 2 | 6 | | 13 | |
| *c*) Special achievement required | | | | | | |
| Yes | 14 | 11 | 18 | 11 | 54 | 48.2 |
| No | 15 | 11 | 24 | 8 | 58 | 51.8 |
| By College | 1 | 1 | 2 | 1 | 5 | 09.3 |
| By Department | 13 | 10 | 18 | 10 | 51 | 90.7 |

| | Teachers' Colleges | | | | | Junior Colleges | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | East | Midwest | West | Total | Per Cent | South | Midwest | West | Total | Per Cent |
| I. Is physical education required? | | | | | | | | | | |
| Yes | 4 | 13 | 8 | 25 | 96.1 | 1 | 2 | 4 | 7 | 87.5 |
| No | | 1 | | 1 | 03.9 | | 1 | | 1 | 12.5 |
| *a*) Time—Years | | | | | | | | | | |
| 1. | | 1 | | 1 | 04.5 | | 2 | | 2 | 28.6 |
| 2. | 2 | 7 | 6 | 15 | 68.2 | 1 | | 4 | 5 | 71.4 |
| 3. | 2 | 1 | 1 | 4 | 18.2 | | | | | |
| 4. | | 1 | 1 | 2 | 09.1 | | | | | |
| Periods per week: | | | | | | | | | | |
| 1. | | | | | | | | | | |
| 2. | 1 | 5 | 7 | 13 | 56.5 | | 2 | 3 | 5 | 71.4 |
| 3. | 3 | 5 | 1 | 9 | 39.1 | 1 | | 1 | 2 | 28.6 |
| 4. | | 1 | | 1 | 04.4 | | | | | |
| *b*) Specific activity required | | | | | | | | | | |
| Yes | 4 | 9 | 5 | 18 | 75.0 | 1 | | 2 | 3 | 42.8 |
| No | | 3 | 3 | 6 | 25.0 | | 2 | 2 | 4 | 57.2 |
| By College | 1 | 3 | | 4 | 22.2 | | | 1 | 1 | 33.3 |
| By Department | 3 | 7 | 5 | 15 | 77.8 | 1 | | 1 | 2 | 66.7 |
| Rhythms | 4 | 5 | 5 | 14 | | 1 | | 2 | 3 | |
| Sports | 4 | 6 | 5 | 15 | | 1 | | 2 | 3 | |
| Gymnastics | 3 | 2 | | 5 | | | | 1 | 1 | |
| Other | 2 | 5 | 3 | 10 | | | | | | |
| *c*) Special achievement required | | | | | | | | | | |
| Yes | 2 | 6 | 3 | 11 | 47.8 | 1 | 1 | | 2 | 28.6 |
| No | 2 | 6 | 5 | 13 | 52.2 | | 1 | 4 | 5 | 71.4 |
| By College | | 1 | | 1 | | | 1 | | 1 | |
| By Department | 2 | 5 | 5 | 12 | | 1 | | | 1 | |

II. Is physical education elective? Yes....7

*East.*—Sarah Lawrence College: "Each student is expected to do three hours a week in physical education. After her physical examination and after a conference with the Director of Physical Education, if she is fit, she may elect her own program."

Goucher College: "According to the present set-up of the college, no specific courses are required. The whole curriculum is pointed toward the attainment of some eight objectives . . . We therefore have no 'requirement' in physical education. We are, however, supposed to contribute toward several of the objectives, namely, good health, social relations, and aesthetic appreciation. . . . "

*Midwest.*—University of Kansas: No requirement. It was eliminated in 1932 as an economy measure. Four units of credit may be counted toward the degree.

Western Reserve University, Frances Payne Bolton School of Nursing: Requirement in physical education eliminated when the school was made a graduate professional school in September, 1934.

Joliet Junior College (Ill.): Requirement eliminated in 1934. Facilities for boys were inadequate so physical education was made elective for all students. Two units of credit may be counted toward the certificate.

*West.*—Scripps College: Requirement eliminated in September, 1934. Reason: admiration of British tradition of play as natural, unrequired activity.

University of California (Berkeley): Requirement eliminated in 1933. Reasons: economy and change in educational policy to allow greater flexibility of curriculum.

Limited: by recommendation of examiners of physical condition....7.

| | Universities and Liberal Arts Colleges | | | | | | Teachers' Colleges | | | | | Junior Colleges | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | East | South | Midwest | West | Total | Per Cent | South | Midwest | West | Total | Per Cent | South | Midwest | West | Total | Per Cent |
| III. Do physical education activities receive credit? | | | | | | | | | | | | | | | | |
| Yes | 16 | 19 | 35 | 18 | 78 | 77 | 4 | 7 | 8 | 14 | 70 | 1 | 3 | 4 | 8 | 100 |
| No | 14 | 4 | 8 | 3 | 23 | 23 | | 7 | | 7 | 30 | | | | | |
| Total No. units required for college degree: | | | | | | | | | | | | | | | | |
| over 170 | | | | | 7 | | | | | 2 | | | | | | |
| 130–169 | | | | | 2 | | | | | | | | | | | |
| 128 | | | | | 8 | | | | | | | | | | | |
| 124 | | | | | 33 | | | | | 3 | | | | | | |
| 120–122 | | | | | 8 | | | | | 1 | | | | | | |
| below 120 | | | | | | | | | | 1 | | | | | 4 | |
| No. units in physical education obtainable | | | | | | | | | | | | | | | | |
| Unlimited | | | | | 12 | | | | | 4 | | | | | | |
| 10–20 | | | | | 15 | | | | | 3 | | | | | | |
| 7–8 | | | | | 8 | | | | | 4 | | | | | | |
| 5–6 | | | | | 7 | | | | | 1 | | | | | 1 | |
| 3–4 | | | | | 26 | | | | | 3 | | | | | 2 | |
| 1–2 | | | | | 2 | | | | | | | | | | 4 | |
| No. Units which may be counted toward degree | | | | | | | | | | | | | | | | |
| Unlimited | | | | | 6 | | | | | 4 | | | | | | |
| 10–20 | | | | | 11 | | | | | 2 | | | | | | |
| 7–8 | | | | | 8 | | | | | 1 | | | | | | |
| 5–6 | | | | | 8 | | | | | 1 | | | | | | |
| 3–4 | | | | | 29 | | | | | 4 | | | | | 2 | |
| 1–2 | | | | | 4 | | | | | | | | | | 2 | |

IV. No Change (119 institutions)

| | Universities and Liberal Arts Colleges | Teachers' Colleges | Junior Colleges |
|---|---|---|---|
| East | 26 | — | 1 |
| South | 16 | 1 | — |
| Midwest | 34 | 13 | 2 |
| West | 16 | 6 | 4 |
| Total | 92 | 20 | 7 |

Changes

*a*) More time required: ....5

Mary Baldwin College: now required for 3rd year students as well as for 1st and 2nd year students.

Mills College, 1933: increased from 2 to 4 years.

Pacific University (Oregon): increased from 2 to 4 years—no unit increase.

Central Missouri State Teachers College: increased from 1 to 2 years to meet state requirement.

Eastern Oregon Normal: increased from 2 to 3 days per week.

*b*) Less time required: ....8

(Colleges which have eliminated all requirements are not included here. See II above.)

Agnes Scott College: no longer required for seniors.

Colorado State College of Agricultural and Mechanical Arts: no longer required of juniors.

Elmira College: reduced from 4 to 3 years.

University of Cincinnati: reduced from 2 years to 1 year.

University of Oregon: may be exempted after 4 terms (from last 2 terms) on basis of skill qualifications.

Woman's College, North Carolina: reduced from 3 to 2 years.

Northeastern Mississippi State Teachers College: March, 1936, only one year (without credit) required.

Santa Barbara: 1 less unit and so one less year required.

*c*) More credit given: ....9

Duke University: requirement of *C* average in physical education for graduation.

Georgia State College for Women: departments of physical education and health combined and credit given for courses offered.

Louisiana Polytechnic: academic credit given. State teacher's certificate: 9 hours of physical education required.

Mount Mary College (Milwaukee): Junior and Senior courses given credit (elective).

Tusculum College: academic credit given (none given formerly).

University of Missouri: from ½ to 1 credit each semester.

University of California (Berkeley): 4 units may be counted toward the degree, instead of 2 as formerly.

Western State College, Gunnison, Colorado: 1934—credit first given.

Eastern Oregon Normal School: from 1 to 3 units per year.

*d*) Less credit given or basis of grading changed: ....6

Colorado State College of Agricultural and Mechanical Arts: from 1 to ½ unit per semester.

Connecticut College: changed from letter grades to *passed, not passed.*

Illinois State Normal University: no change in credit but *grades* eliminated.

Oberlin: local chapter Phi Beta Kappa will not accept any physical education grades.

Syracuse: letter grades eliminated: grading is *passed* or *not passed.*

University of Illinois: College of Letters and Science requires 2 years without credit—may be excused after first semester on the basis of proficiency tests.

*e*) Others:

1) Increase in number and variety of courses offered .....20
2) Increased freedom of election within the requirement .....14
3) Increased emphasis on recreational participation .....15
4) Emphasis on definite skill achievement ..... 6
5) Curtailment of courses due to budget cuts ..... 7

### University of California, Berkeley

(In response to frequent requests for information concerning the results which have followed the elimination of the physical education requirement at the University of California at Berkeley, the following facts are appended).

Changes in the status of physical education since September, 1932

1932–1933: Physical education was required of Freshmen and Sophomores: ½ unit of credit for one course during each of the four semesters in the Lower Division.

1933–1934: Physical education was elective for all students: 1 unit of credit per course, with a maximum of 2 units counted toward the bachelor's degree.

1934–1936: Physical education was elective for all students: ½ unit of credit per course, with a maximum of 4 units counted toward the bachelor's degree.

*Reasons for the Changes.*—1. A change in educational policy in the University, emphasizing flexibility of curriculum, greater freedom to students in planning program.

2. Efforts toward economy.

*Results of Changes.*—1. Upper division and graduate students are enrolling, both with and without credit, in far larger numbers than under the requirement.

2. Student enrollment in activity courses has decreased somewhat.

In 1933–34 the number of students enrolled was about 65 per cent of the former enrollment.

In 1935–36 the number of students enrolled was about 75 per cent of the former enrollment.

3. The greatest initial decrease was in corrective activities (Rest Period adjustments were discontinued), but the enrollment in these classes is now approximating the former enrollment.

4. The types of activities elected are largely the more individual sports (tennis, swimming, archery, fencing, golf, etc.) rather than group sports (basketball, hockey) or dancing (all types). All these activities are offered, however, and enrollment in them is encouraged.

5. A much larger number of students in each college class are electing physical education without credit.

# A Study Pertaining to the Athletic Directorship of Intercollegiate Athletics

By H. S. DeGroat
*Director of Athletics*
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THIS study, pertaining to the Athletic Directorship of Intercollegiate Athletics, is a follow-up of a former study involving forty colleges, some of which are included in this study.* Dr. William L. Hughes, retiring President of the College Physical Education Association, suggested the bringing of the former study up to date so that it could be presented at the annual meeting of the Association in December, 1935. A somewhat similar study of the Middle Atlantic states by Professor William Stevens of Drexel Institute also gives much valuable material along this same line.

The author is very much interested in the establishment of appropriate administrative standards for conducting intercollegiate athletics, which is a field of investigation by a committee of the Association headed by Dr. Frank S. Lloyd of New York University. Finding the time-saving methods and other methods of efficient promotion of the program is very worth while. Simple examples of this are—the use of window envelopes in correspondence, which necessitates only one address being typed by the stenographer instead of two when the other style of envelope is used; planographed printing of forms saves about one-third of the cost of printing; and the use of forms such as "Coach and Manager's Trip Plans" which give a source of information from season to season on planning trips and their costs, proper time of leaving, and other details.

This study was made by the usual method of questionnaire studies, except that a mimeographed copy of the earlier study was sent with the questionnaire, which gave those who were willing to take the time to answer a compensation for the time they spent, and, of course, a copy of the completed study was sent to those cooperating. Out of one hundred and twenty-one institutions contacted, there are fifty-seven included in the final study, giving a fine cross-section of three groups of colleges classified according to enrollment of male students. Class *A* includes eighteen colleges of enrollments between one thousand and sixteen hundred. Class *B* includes eighteen colleges with enrollments between seven-hundred fifty and one thousand. Class *C* includes

* Compiled from data from 57 Colleges and Universities.
18 Class A—1000 to 1600 men students
18 Class B— 750 to 1000 men students
21 Class C— 400 to 750 men students

twenty-one colleges with enrollments between four hundred and seven-hundred fifty. The following tables give the various kinds of teams conducted by the institutions, the amount of the student tax, and the percentage used in promoting the intercollegiate program. The institutions which have the entire control of the athletic program, in which football carries the whole program, and in which all teams are major are indicated. A summary of the tables would show the following:

1. That the eastern and New England colleges listed in this study seem to conduct more teams than the western colleges.

2. That full college control of the intercollegiate program is more predominant in the class *A* and *B* groups.

3. That the student tax seems to contribute more in the class *C* group, in the New England group, and where larger programs are promoted.

4. That six of the fifty-seven do not conduct freshman teams, and thirteen of thirty-three in the *A* and *B* groups conduct only three freshman varsity teams.

TABLE I

| College or University | Teams Conducted | | | | Student Tax | | |
|---|---|---|---|---|---|---|---|
| Class *A* | V | JV | F | Extra | Amount | Used | by AA |
| Over 1000 men | | | | | | | |
| 1. Army | 18 | 18 | 18 | | $ .50 | $ .50‡ | |
| 2. Boston College | 8 | | 7 | | 12.00 | 6.00 | |
| 3. Brown* | 13 | | 12 | | 10.00 | 10.00 | |
| 4. Colgate† | 13 | 1 | 8 | | 20.00 | none | |
| 5. Lehigh*† | 9 | 1 | 7 | | 15.00 | 15.00 | |
| 6. Louisville† | 7 | | 7 | | 3.00 | 3.00 | |
| 7. Maine | 8 | 2 | 5 | | 10.00 | 10.00 | |
| 8. New Hampshire*† | 13 | | 10 | | none | none | |
| 9. N. C. State | 11 | | 8 | | 15.00 | 15.00 | |
| 10. Ohio Univ. | 9 | | 7 | | 6.50 | 6.50 | |
| 11. Oregon Univ. | 8 | | 7 | | 15.00 | 15.00 | |
| 12. Rutgers*† | 13 | 1 | 10 | 1 | 23.00 | | |
| 13. Rensselaer P. I. | 7 | | 7 | | none | none | |
| 14. So. Carolina † | 10 | | 5 | | 9.00 | 8.50 | |
| 15. Tennessee | 9 | | 3 | | none | none | |
| 16. Virginia P. I. | 9 | | 7 | | none | none | |
| 17. Wake Forest † | 6 | | 6 | | 12.00 | 12.00 | |
| 18. Washington Univ. | 6 | | 5 | | 10.00 | 3.00‡ | |
| Class *B* 750 to 1000 | | | | | | | |
| 1. Arkansas* | 7 | 3 | | | 7.00 | | |
| 2. Baylor† | 6 | 4 | | | 7.00 | 7.00‡ | |
| 3. DePauw† | 8 | | 4 | | none | none | |
| 4. Drake† | 8 | | | | 10.00 | | |
| 5. U. of Denver† | 8 | | 1 | | 10.00 | 9.50‡ | |
| 6. Drexel | 5 | | 2 | | 20.00 | 12.00 | |
| 7. Fresno State* | 7 | | 3 | | 13.50 | 3.50 | |
| 8. Kansas State T.† | 6 | | 0 | | 7.00 | 3.50 | |
| 9. Lafayette† | 12 | | 6 | | 12.00 | 12.00 | |
| 10. Long Island U.* | 8 | 1 | 1 | | 6.00 | 3.00 | |
| 11. U. of Montana | 9 | | 3 | | 15.00 | 7.50 | |
| 12. N. Dakota State | 6 | | 4 | | 6.00 | | |
| 13. Oberlin† | 10 | | | | 14.00 | 3.75 | |

*All teams are major—no distinction made.
†Program controlled by College alone.
‡Football carries whole program.

V—Varsity.
JV—Junior Varsity.
F—Freshmen.
Extra—150 lb. teams, etc.

TABLE I *(Continued)*

| College or University | Teams Conducted | | | | Student Tax | | |
|---|---|---|---|---|---|---|---|
| Class *B* | V | JV | F | Extra | Amount | Used | by AA |
| 14. Richmond | 9 | | 5 | | 13.00 | | 9.00 |
| 15. Tufts | 11 | 3 | 11 | | 20.00 | | 16.00 |
| 16. Union | 11 | | 6 | | 25.00 | | 24.00 |
| 17. Vermont | 6 | | 6 | | 30.00 | | 20.00 |
| 18. Williams | 13 | | 12 | | 25.00 | | 25.00 |
| Class *C* under 750 men | | | | | | | |
| 1. Bowdoin † | 9 | 8 | 4 | 1 | 20.00 | | 14.00 |
| 2. Butler | 9 | | 6 | | 2.00 | | 2.00 |
| 3. Case (Cleveland) | 8 | | 6 | | 4.00 | | 4.00 |
| 4. Citadel | 8 | | 3 | | 10.00 | | 10.00 |
| 5. Conn. State | 10 | 2 | 7 | | 13.00 | | 13.00 |
| 6. Colorado College | 6 | | 3 | | 17.00 | | 7.36 |
| 7. Fenn College * | 5 | | 1 | | 10.00 | | 5.00 |
| 8. Howard Payne * | 5 | | 5 | | 9.75 | | 4.37 |
| 9. Kent State | 7 | | | | | | |
| 10. Milwaukee Tch.* | 7 | | 5 | | 10.00 | | 4.00 |
| 11. Muhlenberg | 5 | | | | 15.00 | | 15.00 |
| 12. Ohio Wesleyan | 9 | | 5 | | 10.00 | | 9.00 |
| 13. R. I. State * | 6 | | 6 | | 20.00 | | 14.50 |
| 14. U. of Rochester | 9 | | 5 | | 20.00 | | 10.00 |
| 15. Springfield (Mass.)* | 13 | 2 | 11 | | 24.00 | | 9.00 |
| 16. St. Thomas (Pa.) | 6 | 1 | 2 | | 20.00 | | 20.00 |
| 17. Tennessee Poly. | 5 | | 3 | | 8.00 | | 8.00 |
| 18. Trinity (Conn.)† | 6 | 2 | 1 | 4 | 20.00 | | 19.00 |
| 19. Washburn | 6 | | 6 | | 4.00 | | 4.00 |
| 20. Wesleyan Univ.† | 11 | 1 | 8 | | 10.00 | | 10.00 |
| 21. Worcester Poly.* | 10 | 1 | 1 | | 12.00 | | 7.00 |

Indices refer to note, bottom of page 15.

TABLE II

| Team | Class A | | | Class B | | | Class C | | |
|---|---|---|---|---|---|---|---|---|---|
| | *V* | *F* | *JV* | *V* | *F* | *JV* | *V* | *F* | *JV* |
| Football * | 18 | 18 | 5 | 17 | 11 | 2 | 19 | 15 | 1 |
| Cross Country * | 13 | 6 | 1 | 13 | 4 | | 11 | 5 | 1 |
| Soccer | 5 | 6 | 1 | 5 | 2 | | 5 | 2 | |
| Basketball* | 17 | 18 | 1 | 17 | 12 | 3 | 18 | 18 | 5 |
| Lacrosse | 5 | 3 | 1 | 4 | 3 | | 1 | 1 | |
| Fencing | 2 | 2 | 1 | 1 | | | 1 | | |
| Ice Hockey | 5 | 4 | 1 | 2 | 2 | | 1 | | 1 |
| Baseball* | 17 | 16 | 1 | 13 | 8 | 2 | 15 | 6 | 1 |
| Indoor Track * | 9 | 8 | | 7 | 1 | | 8 | 5 | 1 |
| Track* | 18 | 17 | 1 | 17 | 7 | 1 | 18 | 12 | 1 |
| Tennis * | 18 | 12 | 2 | 17 | 4 | | 19 | 6 | 1 |
| Rifle | 2 | 1 | 1 | | | | | | |
| Pistol | 1 | 1 | 1 | | | | | | |
| Wrestling | 10 | 7 | 1 | 7 | 3 | | 3 | 1 | |
| Gymnastics | 3 | 1 | 1 | | | | 2 | 1 | |
| Swimming* | 11 | 8 | 1 | 9 | 1 | 1 | 14 | 5 | 3 |
| Boxing | 7 | 5 | 1 | 4 | 1 | 1 | 2 | 1 | |
| Golf * | 14 | 7 | 1 | 15 | 3 | | 14 | 2 | |
| Polo | 1 | 1 | 1 | | | | | | |
| Water Polo | 1 | | | | | | | | |
| Winter Sports | 2 | | | | | | | | |
| Squash | | | | | | | 1 | | |

* Most common to all classes. It is evident that the most commonly conducted teams are in football, cross country, basketball, baseball, track, tennis, swimming, and golf.

Table III shows that there is a tendency toward no distinction between major and minor teams. The usual major teams are football, baseball, basketball, and track. Five out of the twenty-one class *C* colleges add swimming and cross country to the major sport list.

Where all teams are considered major there is a tendency on the part of the athletes to consider that they are all on the same level and entitled to the same awards, if any, and it tends to make the promotion of the program more difficult rather than more easy. If the size of the guarantees were used as an indication of major or minor, there is a strong argument in favor of having a distinction between teams. All athletes have the privilege of trying for a major team and if the major team has more award, in the form of charms, sweaters, etc., it likewise may have the financial backing to take care of such things while a minor team with low income generally costs the athletic department considerable to promote it and, therefore, there should be less reason for making awards which are logical and reasonable in major sports.

TABLE III

MAJOR AND MINOR SPORTS

| SPORTS | MAJOR | | | MINOR | | |
|---|---|---|---|---|---|---|
| | A(18) | B(18) | C(21) | A | B | C |
| All Majors | 5 | 2 | 6 | | | |
| Football | 10 | 12 | 16 | | | |
| Baseball | 8 | 10 | 12 | | | |
| Basketball | 8 | 13 | 16 | | | |
| Track | 9 | 13 | 15 | 1 | | |
| Lacrosse | 1 | 1 | 1 | | 2 | |
| Boxing | | 2 | 2 | 2 | 1 | 1 |
| Fencing | | 1 | | 3 | | 3 |
| Golf | | 2 | 2 | 9 | 7 | 9 |
| Gymnastics | | | 1 | 1 | | 2 |
| Ice Hockey | 1 | | 1 | 2 | 1 | |
| Soccer | | 2 | 2 | 2 | 1 | 2 |
| Swimming | 1 | 1 | 5 | 4 | 5 | 9 |
| Polo | | | | 1 | | |
| Pistol | | | | 2 | | |
| Rifle | | | | 2 | 3 | 1 |
| Cross Country | 1 | 3 | 5 | 2 | 5 | 4 |
| Wrestling | | 2 | 2 | 4 | 4 | 1 |
| Tennis | | 3 | 3 | 9 | 9 | 11 |
| Indoor Track | 1 | 1 | | | 1 | |
| Winter Sports | | | | 1 | | 1 |
| Rugby | | 1 | | | | |

In a study of the following tables it is found that the title of Director of Athletics is the one most commonly used by the entire group of colleges studied. Likewise, that the class *A* directors seem to have a less heavy load to carry, though perhaps their loads are more of a nervous strain. In the varied duties of the directors there are eleven different sports that are coached by directors, twenty-six directors

coaching football and basketball, fourteen coaching track, fifteen coaching baseball—the load seems to involve coaching anywhere from two to eight sports by one man. Eight of the directors are three-sport coaches. According to this study, either Mr. Morley Jennings of Baylor University, or someone directly under him, is the most versatile coach, coaching eight different teams during the intercollegiate year.

There are sixteen different varieties of supervision done by the directors of athletics, the most outstanding of which are the promotion of physical education programs by forty directors, and supervision of gymnasiums and buildings by thirty-nine. Supervision of fields, promotion of intramural programs, and the teaching of physical education are the next three types of supervision promoted by the larger group of directors.

The teaching load shows twenty-five different subjects taught by the directors in classes that average about eighteen weeks with a few between ten and twelve weeks in length. The most common subject to all is the teaching of "Administration and Organization of Athletics and Physical Education."

TABLE IV

VARIED TITLES GIVEN HEADS OF ATHLETIC PROGRAM

| Titles | Class of College or University A | B | C |
|---|---|---|---|
| 1. Director of Athletics | 7 | 9 | 10 |
| 2. Athletic Director | 1 | 3 | 3 |
| 3. Prof. of Phys. Ed. and Ath. | 1 | 1 | 5 |
| 4. Graduate Manager | 2 | 3 | |
| 5. Faculty Manager of Athletics | 1 | | 1 |
| 6. Athletic Manager | | 1 | |
| 7. Director of Physical Education | 1 | 1 | |
| 8. Athletic Mgr. or Supervisor | | 1 | 1 |

TABLE V

VARIED DUTIES OF DIRECTORS OF ATHLETICS (as Coaches)

| SPORT | CLASS A | | | CLASS B | | | CLASS C | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *V* | *F* | *A* | *V* | *F* | *A* | *V* | *F* | *A* | Total |
| Football | 3 | 1 | | 4 | 1 | 4 | 12 | | 1 | 26 |
| Basketball | 2 | 1 | | 4 | 3 | 1 | 10 | 2 | 3 | 26 |
| Track | 1 | 1 | | 4 | 1 | | 4 | 1 | 2 | 14 |
| Baseball | 1 | | | 5 | 2 | | 6 | 1 | | 15 |
| Cross Country | | | | | | | 3 | 1 | | 4 |
| Boxing | | | | | | | 1 | | 1 | 2 |
| Winter Sports | 1 | | | | | | | | | 1 |
| Tennis | 1 | | | 1 | 1 | | 1 | | | 4 |
| Swimming, etc. | | | | 1 | 1 | | 1 | | | 3 |
| Golf | | | | | | | 1 | | | 1 |
| Wrestling | | | | | | | 1 | | | 1 |

V—Varsity F—Freshman Varsity
A—Assistant

TABLE VI

| A. Coaching Load — Class: | A | B | C |
|---|---|---|---|
| Coach one sport and assist in another | | 2 | |
| Coach two sports | 1 | 2 | 2 |
| Coach two sports and assist in another | | 1 | 2 |
| Coach three sports | | 1 | 7 |
| Coach three sports and assist in another | | 1 | 1 |
| Coach four sports | | 1 | |
| Coach four sports and assist in another | | | 1 |
| Coach five sports | | | 1 |
| Coach six sports | | | 1 |
| Coach seven sports | 1 | | |
| Coach eight sports | | 1 | |
| **B. As Supervisor or Instructor of** | | | |
| College Physical Education Program | 7 | 15 | 17 |
| Teacher of Physical Education | 5 | 11 | 10 |
| College Business Manager | 4 | 4 | 5 |
| Publicity Director | 6 | 3 | 3 |
| Supt. of College Property | 3 | 4 | 1 |
| Supervision of Fields | 10 | 11 | 12 |
| Supervision of Gym. and Athletic Buildings | 11 | 13 | 15 |
| Promotor of Intramural Program | 5 | 11 | 11 |
| Dean of Men | 1 | | 1 |
| Dormitory Committee Member | | 1 | 1 |
| College Rep. in Chamber of Commerce | | 1 | |
| Commander of Engineers | 1 | | |
| Athletic Business Manager | | 1 | |
| Chairman of Social Committee | | | 1 |
| Faculty Committee Member | | | 1 |
| College Physician and Sup. of Infirmary | | | 3 |
| **C. As Teacher of Academic Classes *** | | | |
| Principles or Methods of Phys. Ed. | 2 | 3 | |
| Theory of Play | 2 | 1 | 1 |
| History of Phys. Ed. | 1 | 1 | |
| Modern Languages | 1 | | |
| Theory of Basketball | 1 | 2 | 1 |
| Theory of Track | 1 | 2 | 2 |
| Medical Supervision and Health | 1 | | |
| Administration and Organization | 1 | 6 | 3 |
| Hygiene and Health Education | 1 | 1 | 3 |
| Theory of Football | | 1 | 3 |
| Accounting | | 1 | |
| Normal Diagnosis | | 1 | |
| Corrective Gymnastics | | 1 | |
| Physiology of Exercise | | 1 | |
| Test and Measures of Phys. Ed. | | 1 | |
| Rules and Officiating | | 1 | |
| Theory of Baseball | | | 1 |
| Fundamentals of Gymnastics | | | 1 |
| Theory of Boxing and Wrestling | | | 1 |
| Athletic Coaching Methods | | | 1 |
| Fatigue and Injuries | | | 1 |
| Agriculture | | | 1 |
| Algebra and Trigonometry | | | 1 |
| Business Law | | 1 | |
| Constitutional Law | | 1 | |

* The average length of the above courses was 18 weeks; some were listed for 12 and 10 weeks, and a very few shorter than that.

In studying the information regarding the hard workers among the directors of athletics, the following directors, or someone directly under them, seem to be leading:

In the class *A* group:

Dr. Guy Stevenson, University of Louisville, seems to be the only real hard worker of this class.

In the Class *B* group:

Morley Jennings, Baylor University, takes the position as the most versatile coach.

Clair F. Bee, Long Island University, seems to spend the longest hours.

Dr. Garfield W. Weede, Kansas State Teachers College of Pittsburg, seems to be the leader in teaching, closely followed by D. C. Moffett, DePauw University, and Earl H. Wight, Fresno State College of California.

In the Class *C* group:

G. O. Penwell, Milwaukee Teachers College, and Frank Keaney, Rhode Island State College, seem to be the most versatile coaches.

Paul D. Hinkle, Butler College, and H. S. DeGroat, Springfield College, carry the heaviest teaching loads.

Joe E. Irish, Colorado College, seems to promote his very efficient program the most easily of any director listed in this study.

TABLE VII

THE HARDEST WORKED DIRECTORS

| CLASS | ASSIGNMENTS | HR. DAY | TEAMS COACH | ACADEMIC CLASS |
|---|---|---|---|---|
| A | | | | |
| University of Louisville | 16 | 12-16 | 7 | 4 |
| B | | | | |
| Baylor University | 12 | 16 | 8 | |
| DePauw University | 12 | 10 | 3 | 4 |
| Kansas State Teachers | 12 | 9 | 2 | 5 |
| Oberlin College | 12 | 12 | 1 | 3 |
| Richmond, University of | 9 | 10 | 4 | |
| Long Island University | 7 | 14 | 3 | 1 |
| Fresno State College | 9 | 8 | | 4 |
| Drake University | 8 | 9 | 2 | 3 |
| C | | | | |
| Milwaukee Teachers | 15 | 10 | 6 | 4 |
| Butler University | 13 | 10 | 3 | 6 |
| Springfield College | 16 | 11 | 3 | 6 |
| R. I. State College | 15 | 10 | 5 | 3 |
| Kent State College | 10 | 10 | 4 | 3 |

SOURCES OF FUNDS AND OTHER ITEMS OF FINANCING A PROGRAM

In studying the tables covering the topics listed in the above heading, one will find that nine different colleges out of fifty-seven carry the entire program of intercollegiate athletics the same as in other departments of the college. Twenty-five out of the fifty-seven furnished coaches' salaries. Six have a combination of college and athletic association. Twenty-seven still leave it up to the athletic asso-

ciation to promote the whole program. Four are fortunate enough to have football provide the necessary funds.

It appears that the most common practice is for the athletic association to purchase the athletic supplies, first aid supplies, and team uniforms. The upkeep of fields and ownership of bleachers seem to be a combination of the college and the athletic association. Some of the directors are satisfied with their present organization, but the majority vote that the college should control the whole program directly and promote it the same as any other division of the college.

In methods of financing, the most common procedure is for the director of athletics to approve drawing of checks, check up money returned by managers from trips and games, turn back the cash to the treasurer, and make the analysis of expenses of the department. It seems a common procedure for the books to be kept by the college treasurer or the association bookkeeper. The most common general statement of financial standing is monthly. While it is not common for the student managers to be allowed petty cash, the author has found it very successful and a time-saver as far as purchase of small items necessary to the promotion of each team is concerned. It seems most advisable to allow the college treasurer or the athletic association treasurer to make out the checks and not the director of athletics. The approval of team budgets is usually left to the athletic board. In budgeting the team expenditures, there seems to be a tendency toward a combination of a set appropriation and the amount necessary to carry the schedule made. Most budgets are made out by the director of athletics.

TABLE VIII

SOURCES OF FUNDS FOR THE INTERCOLLEGIATE ATHLETIC PROGRAM

| SOURCES | SALARIES | | | OTHER EXPENSES | | |
|---|---|---|---|---|---|---|
| | A | B | C | A | B | C |
| College alone | 6 | 8 | 11 | 5 | 3 | 1 |
| College and Football Profits | | 2 | | | 1 | 1 |
| College and Ath. Ass'n. | 3 | 2 | 1 | 2 | 2 | 1 |
| College and A.A. and Football | 2 | | | 3 | | |
| College and A.A. and All Sports | | | | | | 13 |
| Ath. Ass'n and Football Profits | 3 | | | 3 | 1 | |
| Ath. Ass'n and All Sports | 3 | 4 | 7 | 3 | 7 | 3 |

| SALARY COMBINATIONS | | OTHER EXPENSE COMBINATIONS | |
|---|---|---|---|
| College | Ath. Ass'n. | | |
| 50.0% | 50.0% | College .....50% | Ath. Ass'n. .....50% |
| 18.8% | 81.2% | College ..... 8% | Ath. Ass'n .....92% |
| 90.0% | 10.0% | College .....90% | Football .....5%AA5% |
| 25.0% | 75.0% | Ath. Ass'n .....35% | All Sports .....65% |
| 30.0% | 70.0% | Ath. Ass'n. .....56% | Student Tax .....44% |
| 85.0% | 15.0% | College .....75% | Ath. Ass'n. .....25% |
| 80.0% | 20.0% | | |

PURCHASE OF ATHLETIC TEAM SUPPLIES.

| | Class A | Class B | Class C |
|---|---|---|---|
| By College alone | 4 | 3 | 4 |
| By College and Athletic Association | 1 | 3 | 4 |
| By Athletic Association alone | 12 | 11 | 13 |
| **UPKEEP OF PLAYING FIELDS AND SURFACES** | | | |
| By College alone | 6 | 5 | 7 |
| By College and Athletic Association | 7 | 8 | 8 |
| By Athletic Association alone | 5 | 3 | 6 |
| **PURCHASE OF FIRST AID SUPPLIES** | | | |
| By College alone | 3 | 4 | 4 |
| By College and Athletic Association | | 1 | 3 |
| By Athletic Association alone | 3 | 5 | 6 |
| From Infirmary Fee | | | 2 |
| **OWNERSHIP OF BLEACHERS** | | | |
| By College alone | 8 | 7 | 7 |
| By College and Athletic Association | 2 | 7 | 4 |
| By Athletic Association alone | 7 | 3 | 10 |
| **PURCHASE OF TEAM UNIFORMS** | | | |
| By College alone | 4 | 4 | 3 |
| By College and Athletic Association | | 1 | 2 |
| By Ass'n and Player (Information not collected) | | | |
| By Athletic Association alone | 12 | 12 | 14 |

IS THE DIRECTOR SATISFIED WITH PRESENT ORGANIZATION?

| | | | |
|---|---|---|---|
| Yes | 8 | 13 | 15 |
| No. | 6 | 4 | 5 |

VOTES FAVORING THE FOLLOWING STATEMENTS*

| | | | |
|---|---|---|---|
| 1. College should control all directly | 2 | 5 | 8 |
| 2. College should pay all coaches' salaries | 3 | 9 | 10 |
| 3. College should collect student tax and control whole program | 4 | 9 | 7 |
| 4. Student tax should be increased | 3 | 3 | 6 |
| 5. College should help more | 1 | 1 | 2 |
| 6. Too many expenses borne by athletic council | 1 | | |
| 7. Student Tax should be made compulsory | 2 | | |

## FINANCES

| | Class A | Class B | Class C |
|---|---|---|---|
| **A. APPROVAL FOR DRAWING CHECKS** | | | |
| By Director or Graduate Manager | 10 | 9 | 9 |
| By College Treasurer or Business Office | 1 | 3 | 6 |
| By Director and College Treasurer | 2 | 2 | |
| By Treasurer of Athletic Association | 2 | 1 | 3 |
| By College President | 1 | | 2 |
| By the Coach | 1 | | |
| By Auditor or Officer or Assistant Director | 1 | 1 | 1 |
| By Treasurer of A.A. and College Treasurer | | 1 | |
| **B. CHECKING OF MONEY EXPENDED BY TEAM MANAGERS** | | | |
| By Director or Graduate Manager | 12 | 9 | 14 |
| By Manager with Director | 2 | | |
| By College Treasurer or Business Office | 1 | 3 | 2 |
| By the Coach | 1 | | |
| By Treas. of Athletic Association | 1 | | 3 |
| By Director and General Manager | | 1 | |
| By State Auditor | | 1 | |
| By Faculty Member | | | 1 |
| Manager not allowed to handle money | | | 2 |

* Statements 1-2-3-4 were on questionnaire; 5-6-7 were written by ones replying.

| | Class A | Class B | Class C |
|---|---|---|---|
| **C. Money from Games Turned in to Treasury** | | | |
| By Director or Graduate Manager | 5 | 10 | 12 |
| By Director or other officer | 1 | 1 | |
| By Auditor, Assistant Director, etc. | 6 | 1 | 1 |
| By Manager and Director | 4 | | |
| By Coach or Coach and Manager | 1 | 3 | 4 |
| By Team Manager | | 2 | 6 |
| **D. Team Expense Analysis Supervised or Made Out** | | | |
| By Director or Graduate Manager | 9 | 10 | 12 |
| By Director and Auditor or Officer | 2 | 3 | 2 |
| By Auditor and Assistant Director | 3 | | |
| By Director and Manager | 1 | | 3 |
| By Treasurer of Athletic Association | 1 | | |
| By Coach or Coach and Treasurer | 1 | | 1 |
| By Business Office, College Treasurer, etc. | | 2 | |
| By Graduate Treasurer | | 1 | |
| By Director and Coach | | 2 | |
| By Faculty Member | | | 1 |
| **E. Books Kept** | | | |
| By College Treasurer or Business Office | 9 | 9 | 7 |
| By Athletic Office and College Treasurer | | 2 | |
| By Director and Treasurer | | 2 | |
| By Director or Graduate Manager | 3 | 1 | 5 |
| By Athletic Association Officer or Treasurer | 5 | 3 | 6 |
| By State Comptroller | | | 1 |
| By Director and Managers | | | 1 |
| By Faculty Member | | | 1 |
| **F. General Statement Prepared** | | | |
| At end of each season | 2 | 1 | |
| Each half year | 1 | 4 | |
| Quarterly | 1 | | 2 |
| Every two weeks | 1 | | |
| Monthly | 9 | 7 | 8 |
| Annually | 4 | 4 | 7 |
| After each game | | | 2 |
| Bi-monthly | | | 1 |
| **G. Are Team Managers Allowed Petty Cash?** | | | |
| Yes | 5 | 3 | 4 |
| No | 12 | 12 | 16 |
| **H. Checks Made Out** | | | |
| By College Treasurer | 8 | 12 | 9 |
| By Director or Graduate Manager | 2 | 1 | 4 |
| By Director and College Treasurer | 1 | | |
| By Business Manager or Bookkeeper | 1 | | |
| By Treasurer of Athletic Association | 5 | | 6 |
| By Special Officer of Association | | 2 | 1 |
| By State Comptroller | | | 1 |
| **I. Team Budgets Approved** | | | |
| By Director or Graduate Manager | 6 | 6 | 3 |
| By College Treasurer or Business Manager | 1 | 3 | 1 |
| By Director and College Treasurer | 1 | | |
| By College President | 2 | | 2 |
| By Athletic Council or Board | 7 | 9 | 12 |
| By Student Tax Committee | | 1 | 1 |

| | Class A | Class B | Class C |
|---|---|---|---|
| By Faculty Member | | | 1 |
| Team having no budget | | | 1 |
| **J. Team Budgets Controlled** | | | |
| No budget system used | 3 | 3 | 1 |
| Set appropriation for each team | 7 | 4 | 6 |
| According to games arranged | 1 | 6 | 4 |
| Combination of above two | 5 | 6 | 7 |
| According to football profit | 1 | | |
| **K. Team Budgets Made Out** | | | |
| By Director or Graduate Manager | 11 | 10 | 7 |
| By Board of Control or Council | 1 | | 3 |
| By Director, Athletic Council, Manager | | 1 | 1 |
| By Business Manager and Director | 2 | 1 | 4 |
| By Director and Team Manager | 1 | | 3 |
| By Director and Assistant | 1 | | |
| By Director and Student Treasurer | | 1 | |
| By Director and College Treasurer | | 1 | |
| By Faculty Chairman | | | 1 |

## COST OF PROGRAM

The following table gives the cost of the programs with the salary of coaches not included. The high cost seems to be in the organizations that are carrying the whole burden. Where the lower cost is shown the college may be furnishing such items as upkeep of fields, part of the athletic equipment, first aid, and bookkeeping. It would not show in the figures appearing in the tables. There is a wide variation due to the location of the college, the organization and combination of authority, and the vital fact as to whether football and any other teams show a profit. It is interesting to note that two of the institutions run their whole program at a profit and four show no net cost.

L. Net Cost of Intercollegiate Program

| | No. of Teams | Colleges | Cost Above Income |
|---|---|---|---|
| Class A | 54 | 1 | $ 340,000 |
| | 25 | 1 | 43,400 |
| | | 1 | 28,500 |
| | 23 | 1 | 26,000 |
| | 17 | 1 | 41,000 |
| | 16 | 1 | 38,000 |
| | 15 | 1 | 36,000 |
| | | 1 | 2,500 |
| | 14 | 1 | 5,000 |
| | | 1 | 2,000 |
| | 12 | 1 | Profit |
| Class B | 25 | 1 | 12,000 |
| | | 1 | 10,000 |
| | 14 | 1 | 14,000 |
| | 12 | 1 | 30,000* |
| | | 1 | 13,000 |
| | | 1 | 10,000 |
| | 10 | 1 | 40,000 |
| | | 1 | 25,000 |
| | | 1 | 12,315 |
| | | 1 | 5,000 |
| | 8 | 1 | 8,000 |
| | 6 | 1 | Slight Profit |

* Total, not net cost.

| | No. of Teams | Colleges | Cost Above Income |
|---|---|---|---|
| Class C | 25 | 1 | 4,000 |
| | 22 | 1 | 30,000 |
| | 19 | 1 | 10,000 |
| | 15 | 1 | 5,000 |
| | 14 | 1 | no cost |
| | | 1 | 8,867 |
| | | 1 | 6,000 |
| | 13 | 1 | 8,000 |
| | 12 | 1 | no cost |
| | | 1 | 7,500 |
| | 11 | 1 | 18,000 |
| | 9 | 1 | no cost |
| | | 1 | 10,000 |
| | 8 | 1 | 6,000 |
| | 7 | 1 | 6,500 |
| | 6 | 1 | 1,600 |

## ANNUAL REPORTS

The tables show seven different methods of making annual reports, but the director of athletics or graduate manager is the one most commonly assigned this duty. Such reports are generally presented to the college president or the athletic board. Some of them include as many as seven different items. The four most common are the financial analysis, recommendations of changes, etc., trends and problems facing the department, and the outstanding features of the year.

ANNUAL REPORT OF INTERCOLLEGIATE PROGRAM

| | | A | B | C |
|---|---|---|---|---|
| Made: | By Director or Graduate Manager | 11 | 11 | 9 |
| | By Business Office or Auditor | 3 | 3 | |
| | By Treasurer | 1 | | 1 |
| | By General Manager | | 1 | |
| | By Director and College Treasurer | | | 3 |
| | By Director and Chairman of Athletic Board | | | 1 |
| | By Athletic Committee | | | 2 |
| Made: | To College President | 6 | 5 | 5 |
| | To Athletic Council or Board | 5 | 6 | 6 |
| | To President and Council | 1 | | 5 |
| | To Trustees | 1 | 4 | |
| | To President and Trustees | 1 | | |
| | To Dean of College | | 1 | |
| | To Student Association Committee | | | 1 |
| | To Conference or League | | | 1 |

REPORTS INCLUDE

| | | | |
|---|---|---|---|
| Outstanding features of year | 9 | 9 | 8 |
| Financial analysis of expenses | 11 | 10 | 16 |
| Scores of teams | 6 | 6 | 12 |
| Recommendations | 11 | 12 | 13 |

| | A | B | C |
|---|---|---|---|
| Tendencies and Problems | 10 | 11 | 10 |
| Participation of students | | | 1 |
| Balance on hand | | 1 | |

NOTE: One college makes monthly report of above to Athletic Board.

HOW FIELDS AND PLAYING SURFACES ARE SUPERVISED

| | | | |
|---|---|---|---|
| By Superintendent of Grounds | 4 | 1 | 2 |
| By Director or Graduate Manager | 10 | 8 | 9 |
| By Director and Superintendent of Ground | 3 | 4 | 4 |
| By Field Manager | | 3 | |
| By Athletic Board and Superintendent of Property | | 2 | |
| By Director and Coaches | | | 2 |
| By Coaches and Member of Committee | | | 1 |

## AWARDS TO PLAYERS

### A. VARSITY LETTER CERTIFICATES

| | | | |
|---|---|---|---|
| One for entire college career | 2 | 5 | 6 |
| One for each letter awarded | 8 | 4 | 10 |
| One for first letter only | 5 | 1 | |
| Only one in each sport | | | 1 |
| One each year | 1 | | |
| One for first letter and senior year | 1 | | |
| One to three-letter men at graduation | | 1 | |
| One for each sport, extra seasons added | | 1 | |
| None awarded | | | 1 |

### B. GOLD CHARMS AWARDED

| | | | |
|---|---|---|---|
| None awarded | 1 | 5 | 4 |
| Footballs | 12 | 2 | 9 |
| Soccerballs | | | 1 |
| Basketballs | 7 | 5 | 9 |
| Track Shoes | 8 | 3 | 8 |
| Baseballs | 7 | 3 | 4 |
| Varsity Charm | | 3 | 3 |
| All Sports (13 varsities) | 2 | | |
| Tennis | | 1 | |
| Swimming | | | 1 |
| Athletic Service Charm | | | 1 |

### C. GOLD CHARMS AWARDED FOR

| | | | |
|---|---|---|---|
| Winning of 3rd letter | 1 | 1 | 4 |
| Only championship teams | 6 | 6 | 9 |
| Excellent teams sometimes | 3 | 1 | 1 |
| Occasionally | 3 | 1 | 1 |
| At graduation | 2 | 2 | 3 |
| One in each sport—1st letter | 1 | | |
| One for each letter | 1 | | |
| Conference point system | | 1 | |
| Defeating major opponent | 1 | | |
| Playing maximum number of seasons in one or more sports (service) | | | 1 |
| Breaking track or swimming record | | | 1 |

D. Sweater Awards

| Awarded for | Class and No. of Colleges | | No. of Teams |
|---|---|---|---|
| 1st letter and to Seniors | A | 1 | with 5 major teams |
| | B | 1 | with 6 varsities |
| | C | 2 | with 5 varsities |
| One each year | A | 4 | one with 13 var. |
| | | | one with 3 var. |
| | | | two with 7 var. |
| | B | 3 | two with 8 var. |
| | | | one with 9 var. |
| | C | 1 | with 5 major teams |
| All teams each letter | A | 1 | with 2 major teams |
| | B | 4 | with 2 major teams |
| | | | one with 4 majors |
| | | | one with 5 var. |
| | | | one with 6 var. |
| | | | one with 8 var. |
| | C | 1 | one with 9 var. |
| Only first letter in each sport | A | 6 | one with 13 var. |
| | | | two with 9 var. |
| | | | one with 8 var. |
| | | | one with 7 var. |
| | | | one with 2 var. |
| | B | 3 | two with 11 var. |
| | | | one with 10 var. |
| | C | 8 | one with 11 var. |
| | | | one with 10 var. |
| | | | three with 9 var. |
| | | | one with 8 var. |
| | | | one with 7 var. |
| | | | one with 5 var. |
| To Seniors only | A | 2 | one with 5 major teams |
| | | | one with 3 major teams |
| To Senior football players | C | 2 | one with 11 var. |
| | | | one with 8 var. |
| First two letters only | A | 1 | one with 9 var. |
| | B | 1 | one with 3 major teams |
| | C | 0 | |
| First and third letter | A | 0 | |
| | B | 2 | one with 9 var. |
| | | | one with 6 var. |
| First letter and each 12 hours work | C | 1 | one with 6 var. |
| First 2 letters—blanket or framed letter with record for 3rd letter | C | 1 | one with 9 var. |
| Lettermen in junior year | C | 1 | one with 6 var. |
| First letter in major sport | C | 2 | one with 5 var. |
| | | | one with 4 var. |
| No sweaters awarded by policy | C | 5 | |

THE PRACTICE IN GIVING SWEATERS AS AWARDS IN NEW ENGLAND COLLEGES AND UNIVERSITIES*

| The Practice | Number of Inst. | Institution Involved |
|---|---|---|
| 1. No sweaters awarded..... | 4 | Amherst, Clark, Maine, M.I.T. |
| 2. One sweater for any one student during his 4 years. Major sports only ..... | 8 | Bowdoin, Coast Guard Acad., Conn. State, Springfield (Senior Football), Trinity, Tufts, Yale |
| 3. One sweater in each major sport.. | 10 | Bates, B.C., Holy Cross, Middlebury, Northeastern, R. I. State, Wesleyan, Worcester Tech., Boston U. |
| 4. Only one sweater in each year. May be won in any sport ..... | 1 | Brown University |
| 5. One sweater in each sport..... | 2 | Dartmouth, New Hampshire |
| 6. May win 2 sweaters in each major sport (1st and senior year)..... | 2 | Norwich, Univ. of Vermont |

E. ROCKY MOUNTAIN CONFERENCE ATHLETIC AWARD SYSTEM

According to a rule recently adopted by the Rocky Mountain Conference a school may purchase for an athlete only one sweater a year. An athlete qualifying in more than one sport may choose the sweater he prefers. When he does not take a sweater in a sport, he is awarded points according to the following table. Various awards are later made according to the number of points he accumulates. When he takes a sweater he does not get points for the sport that year.

SCHEDULE OF ATHLETIC POINTS

| | Fr. | Soph. | Jr. | Sr. | Letter | Total Possible |
|---|---|---|---|---|---|---|
| Football ..... | 10 | 3 | 4 | 5 | 10 | 40 |
| Basketball ..... | 2 | 3 | 4 | 5 | 10 | 40 |
| Baseball ..... | 2 | 3 | 4 | 5 | 10 | 40 |
| Track ..... | 2 | 3 | 4 | 5 | 10 | 40 |
| Tennis ..... | 1 | 2 | 3 | 5 | 7 | 28 |
| Wrestling ..... | 1 | 2 | 3 | 4 | 7 | 28 |
| Boxing ..... | 1 | 2 | 3 | 4 | 7 | 28 |
| Swimming ..... | 1 | 2 | 3 | 4 | 7 | 28 |
| Golf ..... | 1 | 2 | 3 | 4 | 7 | 28 |
| Gymnastics ..... | 1 | 2 | 3 | 4 | 7 | 28 |

SCHEDULE OF ATHLETIC AWARDS

10 to 24 points—Rocky Mountain Faculty Athletic Conference Charm.

25 to 49 points—Blanket.

50 to 70 points—Bathrobe.

71 to limit—Certificate.

Points are not lost when one of the earlier awards are chosen. (Above information furnished by Jo Irish, Colorado College.)

* Reported by Dr. J. Harmon, Boston University.

### F. Blanket Awards

| | No. of Colleges | How Awarded |
|---|---|---|
| Class A.... | 1 | Choice of sweater or blanket—one only in each sport |
| | 1 | Three-letter men in any sport |
| Class B.... | 1 | Third letter—choice of sweater or blanket |
| | 1 | To Seniors |
| | 1 | To Senior 3-sport men |
| | 1 | To Senior football men |
| Class C.... | 1 | To Seniors—choice of sweater or blanket |
| | 1 | Three-letter men in football occasionally |
| | 1 | Three-letter men in any sport |
| | 1 | To Seniors |
| | 1 | To nine-letter men only |
| | 1 | To Seniors by Honor Society |

### G. Framed Certificates Awarded

Class A—1 college—Major award.

### H. Other Awards

One college gives key to Senior three-letter men—11 varsities.
One college gives Life Time Pass to Home Events.
One college reports giving uniforms to captains.
Framed Pictures of the Team—
To players and coaches: One college with 9 Varsities.
To Coaches: One college with 11 Varsities.

## ATHLETIC AWARDS

The preceding tables indicate that the majority of the colleges give a varsity certificate with each letter awarded, but there is a tendency toward one certificate, which includes the entire career of the athlete, being awarded in his senior year. This is a very fine type of award and has been known to work out financially better than awarding a certificate with each letter, the institution being able to turn out a very excellent certificate, framed, for each athlete at a lower cost than the other method.

The award of gold charms seems to be only occasional and for outstanding teams, thirty-one out of fifty colleges seeming to award such charms only occasionally. A varsity charm which is suitable for all sports with a changeable panel seems to be the most reasonable and does not cost too much.

There are twenty-three different ways of awarding sweaters. Seventeen colleges seem to favor giving only one sweater with the first letter in each sport.

## CUTS FROM ACADEMIC CLASSES

The following table lists sixteen system of allowing cuts from academic classes by students competing on teams. Twenty-eight institutions require the cuts to be made up. There are six that allow no cuts at all and six have no limit on cuts.

CUTS FROM ACADEMIC CLASSES ALLOWED ATHLETES ON TRIPS

| | A | B | C |
|---|---|---|---|
| No cuts allowed | 2 | 2 | 2 |
| No limits on cuts | 2 | 2 | 2 |
| Cuts according to the schedule | 2 | 2 | |
| 2 cuts allowed each team | | 1 | |
| 4 full days allowed each team | | 2 | 2 |
| 3 full days allowed each team | | 1 | 1 |
| 6 full days allowed each team | 4 | | 1 |
| 5½ to 9 days allowed each team | | | 1 |
| 8 full days allowed each team | 1 | | 1 |
| 3 cuts per quarter | | | |
| 6 cuts per semester | | | 1 |
| Cuts excused but work must be made up | 11 | 6 | 11 |
| 12 cuts per half year | 1 | | |
| 6 cuts for half-year freshmen | 1 | | |
| Only 8 games away allowed | | 1 | |
| One-third cut for each full cut. (cut allowance) | | 2 | |
| Maximum hours listed by sports | | | 1 |

## ASSISTANTS TO THE DIRECTOR

Looking back over the load of the various directors of athletics, one can easily see the need for many of them having assistants, either part-time or full-time. The following table shows that seventeen have one full-time assistant, while eleven others have part-time assistants; the majority have a full-time stenographer, while many have an additional part-time stenographer.

| | No. | A | B | C |
|---|---|---|---|---|
| No assistants | 4 | | | |
| Full-time assistants | 2 | 1 | 1 | |
| | 1 | 7 | 5 | 5 |
| Part-time assistants | 3 | | | 1 |
| | 2 | | 1 | |
| | 1 | 3 | 2 | 4 |
| Full-time stenographers | 2 | 3 | 1 | |
| | 1 | 13 | 8 | 7 |
| Part-time stenographers | 3 | 1 | | |
| | 2 | | 2 | 1 |
| | 1 | 2 | 5 | 13 |

## PLAYERS' "COMPS"

Complimentary tickets for players at home games and visiting team players are a source of much trouble to every director. The following list shows thirty-five different ways of giving out such tickets, the most common use seems to be allowing two "comps" to each man on the squad or two to lettermen and one to non-lettermen.

The most common of the eight systems shown below of appointing varsity team managers seems to be the one allowing the manager to work up and be appointed by the director of athletics or the director and the athletic board. The most advisable system, after some study, would be the appointment upon the recommendation of the manager and the coach to the director and the director to the athletic board or council. Most of the colleges appoint their managers

according to their choice of sports and not without giving any choice.

There seems to be a distinct tendency toward the director of athletics handling all of the correspondence and allowing the team managers to promote the practice of the team and the games themselves. This is a tendency toward direct control by the college or the athletic association. Whatever experience is gained by student managers handling correspondence and such details is oftentimes offset by misunderstandings and inefficiency in the promotion of the program. Student managership requires very careful supervision by the director and, undoubtedly, is more costly than the other system.

The care of visiting teams is a feature of the promotion which seems to need some thought on the part of directors of athletics. Forty-five of the institutions listed in the figures below have no separate organization. Only twelve have dependable and well-organized systems, and twenty-six either state that their organization needs more supervision or is not always dependable. One of the real returns from promotion of intercollegiate athletics is the sportsmanship and the friendship developed between players of different institutions. If such a feeling cannot be developed there is something lost from the promotion of our athletic programs.

PLAYERS' "COMPS"

| | A | B | C |
|---|---|---|---|
| 1. 5 allowed each player on the squad | 1 | 1 | |
| 2. 2 allowed each player on the squad | | 7 | 4 |
| 3. 1 allowed each player on the squad | | | 4 |
| 4. 2 allowed each player who has played | 3 | | |
| 5. 2 allowed players called out | | | 1 |
| 6. 1 allowed players called out | 1 | 1 | |
| 7. 2 allowed players called out—1 to others | | 1 | |
| 8. 3 allowed players called out—others 1 | | 1 | |
| 9. 2 to lettermen | | | 1 |
| 10. 2 to lettermen—others called out 1 | 1 | | 1 |
| 11. 2 to lettermen—others on squad 1 | 1 | | 2 |
| 12. 2 allowed Seniors | | | 1 |
| 13. 3 allowed Seniors | | | 1 |
| 14. 2 allowed Seniors making trip | 2 | | |
| 15. Seniors 4, Juniors 3, Sophs. 2 | 1 | | 2 |
| 16. Seniors 3, Juniors 2, Sophs. 1 | 2 | | |
| 17. Seniors 3, Juniors 2, Sophs. 2, others 1 | 1 | | |
| 18. Seniors 2, others 1 | 1 | | |
| 19. 1 for each letter in that sport, others 1 | 1 | | 1 |
| 20. 4 to all who played previous game, others 2 | | | 1 |
| 21. 2 for half the home games all on squad | 1 | | |
| 22. No set number allowed | 1 | | |
| 23. None allowed at all | | | |
| 24. Student ticket made complimentary | | 1 | 1 |
| 25. 1 to players on minor or send teams | | | 1 |
| 26. 2 each to football and baseball men | 1 | | |
| 27. 3 allowed each assistant manager | 1 | 1 | |
| 28. 2 allowed each assistant manager | | 2 | |
| 29. 1 allowed each assistant manager | | 4 | 1 |
| 30. 2 allowed for visiting parents | | | 3 |
| 31. 1 allowed for visiting parents | | 1 | 3 |

| | A | B | C |
|---|---|---|---|
| 32. Half price for parents visiting | 1 | | |
| 33. 2 allowed for relatives only | | 1 | |
| 34. 1 to each member of family and 1 girl friend | | | 1 |
| 35. 3 to Captains | 1 | | 2 |

APPOINTMENT OF VARSITY TEAM MANAGERS

| | | | |
|---|---|---|---|
| 1. By Director—after working up as assistant | 5 | 6 | 5 |
| 2. By Director and A.A. Board | 5 | 1 | 9 |
| 3. By former manager's recommendation | | | |
| 4. By former manager and coach recommendation | 4 | 5 | 1 |
| 5. By former manager, coach and squad | 1 | | 2 |
| 6. By Board of Electors | 3 | 2 | |
| 7. By Phys. Ed. Staff—recom. of coach and mgr. | | 2 | |
| 8. By Director, coach and vote of team | | 1 | |

ASSISTANT MANAGERS ASSIGNED TO SPORTS

| | | | |
|---|---|---|---|
| By own choice of sport | 16 | 13 | 15 |
| Without choice Director | 1 | 2 | 2 |

NUMBER OF ASSISTANT MANAGERS

| | Juniors | | | Sophomores | | | Freshmen | | |
|---|---|---|---|---|---|---|---|---|---|
| Major Teams | A | B | C | A | B | C | A | B | C |
| Average | 2 | 2 | 2 | 2-4 | 1 | 2-3 | 4 | 1 | 4 |
| Minor Teams | | | | | | | | | |
| Average | 1-2 | 1 | 1-2 | 2 | 1 | 2 | 2 | 1 | |

HANDLING OF GAME CORRESPONDENCE

| | A | B | C |
|---|---|---|---|
| 1. All handled by Director or Graduate Manager | 9 | 8 | 13 |
| 2. By Director and Coaches | 1 | 5 | 5 |
| 3. By Student Managers alone | | | |
| 4. By Director and Student Managers | 3 | 2 | 1 |
| 5. By Coaches and Managers | | | |
| 6. Football by Director—other sports by managers | 3 | 2 | 1 |
| 7. Basketball by Director—others by managers | 4 | 2 | 3 |
| 8. By Director, Coaches, and Managers | 3 | | |

DETAILS OF CORRESPONDENCE SYSTEM

| | | | |
|---|---|---|---|
| 1. Managers do not handle correspondence | 9 | 10 | 16 |
| 2. Director opens all manager's mail | 5 | 4 | 10 |
| 3. Director inspects all manager's mail | 4 | 4 | 9 |
| 4. Director writes suggestions on incoming mail | 4 | 3 | 4 |
| 5. Mail is registered in book: date of letter | 1 | | 2 |
| college from | | | 2 |
| note of content | | | 2 |
| team involved | 2 | | 3 |
| 6. Outgoing mail is inspected by director | 5 | 2 | 8 |
| 7. Unanswered letters checked upon in 5 days | 1 | 4 | 3 |
| 8. Incoming letters stamped with date of arrival | 1 | 1 | 1 |
| 9. Incoming letters marked according to sport for filing purposes ex. Track '35, etc. | 5 | 4 | 5 |
| 10. Common file—letters filed by sports | 5 | 5 | 12 |
| 11. Separate files for each manager | 4 | 1 | 1 |
| 12. Basket for each manager in Director's office | 4 | 1 | 1 |
| 13. Separate desk for managers | 3 | 1 | |
| 14. Desks available but unassigned | 3 | 1 | 4 |
| 15. Correspondence kept in manager's own room | 1 | | |

ORGANIZATION CARING FOR VISITING TEAMS

| | | | |
|---|---|---|---|
| 1. Dependable and well-organized | 5 | 3 | 4 |
| 2. No separate organization | 13 | 15 | 17 |
| 3. Needs more supervision | 7 | 2 | 3 |
| 4. Not always dependable | 7 | 4 | 3 |
| 5. Supervised by Faculty member | 2 | 3 | 3 |

## OFFICE FORMS AND GAME ADVERTISING

The figures below give a list of twenty-three different styles of office forms used by different institutions, six of which are common to between twenty and twenty-nine institutions, while there are ten others that are listed by at least ten of the institutions. By having proper forms that can be used efficiently there is a saving of time and a real source of keeping records for histories and for publicity. From the samples of forms sent in and from the experience of the writer, there seem to be excellent forms used by the following colleges, and probably many other colleges not known to the director, namely, Penn State College, Lehigh, and Army Athletic Association.

A careful study of the game advertising will show that most of the colleges use store window and street car posters, direct mail to their alumni, windshield stickers, and have either a full-time or part-time publicity director.

### Office and Record Forms

| | A | B | C |
|---|---|---|---|
| 1. No forms | | 1 | 2 |
| 2. Home game form | 13 | 7 | 9 |
| 3. Away game form | 11 | 7 | 7 |
| 4. Season team scores form | 6 | 3 | 7 |
| 5. Season financial form | 6 | 3 | 7 |
| 6. Proposed schedule form | 4 | 3 | 3 |
| 7. Schedule making form | 4 | 4 | 3 |
| 8. Proposed budget form | 7 | 4 | 4 |
| 9. Visiting team form | 4 | 3 | 3 |
| 10. Squad statistics form for sport editors | 7 | 4 | 5 |
| 11. Recommendations for letters or numerals | 4 | 4 | 5 |
| 12. Recommendation form for manager appointments | 5 | | 4 |
| 13. Form for assignment of assistant manager for home events | 1 | 1 | 2 |
| 14. Form for checking attendance and work of assistant managers | 1 | 3 | 3 |
| 15. Form for notifying manager of unanswered letters | | | 1 |
| 16. Cash receipt form for use on trips, etc | 8 | 7 | 4 |
| 17. Form for drawing money for team event | 8 | 8 | 6 |
| 18. Athlete's history blank for publicity data | 4 | 4 | 3 |
| 19. Form for payment of bills by check | 8 | 8 | 7 |
| 20. Ticket sellers form | 11 | 10 | 5 |
| 21. Scrap book for each sport | 1 | | |
| 22. Record of all lettermen | | 1 | 1 |
| 23. Manager's reports bound each season | | | 1 |

### Game Advertising

| | |
|---|---|
| 1. Posters placed in store windows | 42 |
| 2. Posters on street cars. 20 for $1 per day, 25 for $2, 250 at 3c each | 11 |
| 3. Posters on busses | 5 |
| 4. Auto tire covers. Sports using: Football 15—Track—Basketball | 20 |
| 5. Bumper cards | 6 |
| 6. Direct mail to alumni. 1 to 6 times per year. 400 to 7000 men | 35 |
| 7. Direct mail to Service clubs | 3 |
| 8. Street banners. Mostly football | 10 |
| 9. Paid newspaper ads. Football 16—All sports 3—BB 7—Baseball 5 | 28 |
| 10. Newspaper mats distributed | 37 |
| Cost Class A colleges | $50 to $1200 |
| Class B colleges | $25 to $1500 |
| Class C Colleges | $50 to $ 400 |

11. Have employed Publicity Director—part time 19; full time 14..... 33
12. Poster distributed in factories..... 1
13. Rent billboards from advertising agencies..... 7
14. Use windshield stickers..... 22
15. Print own posters..... 8
16. Have large bulletin boards about city with home events listed..... 11
Number of boards: 1 in 5 colleges
2 in 1 college
4 in 4 colleges
5 in 1 college

## LIMIT OF GAMES IN THE VARIOUS SPORTS

The following table shows the number of games allowed by the different institutions in the various sports in varsity and freshman competition. Careful study of this would show that the majority of the colleges allow—

| | |
|---|---|
| 9 football games | 8 to 10 swimming meets |
| 15 to 20 basketball games | 6 boxing matches |
| 10 to 14 hockey games | 6 golf matches |
| 8 soccer games | 14 to 16 baseball games |
| 4 to 5 track, dual meets | 2 to 4 indoor track championships |
| 4 to 6 cross country meets | 1 or 2 outdoor track championships |
| 6 to 8 wrestling meets | 1 or 2 cross country championships |

In freshman competition, the number of games is much reduced, but a study of them would give some information to the director in promoting his program.

The writer feels that the schedule of any sport should not be longer than one in which the players can continue to improve and secure an educational value in such competition. In some sports the educational value of playing must be spread over more than one season. As soon as an athlete ceases to learn, the playing of the games may become drudgery or only a contest taking time from other educational endeavor. In team games, such as football, soccer, etc., a schedule of eight or nine games seems to fall in the above area. In baseball where some of the players, such as the pitchers and catchers, cannot play in every contest, there is a reason for playing between sixteen and twenty games. This is a question which needs study by directors of athletics.

## LIMITS OF GAMES SCHEDULED

### Varsity Team Limits

*A, B* or *C* means only college of that class.

| No. of Games | Number of colleges by sports * | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | F | BB | H | SO | T | TE | CC | W | GY | S | BX | G | L | B | IT | TC | CCC | WS |
| 1 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 4 | 10 | 5 | .... |
| 2 | .... | .... | .... | .... | 2 | .... | A | .... | .... | .... | .... | .... | .... | .... | 4 | 6 | 4 | .... |
| 3 | .... | .... | .... | C | 4 | .... | A | .... | .... | .... | C | C | .... | .... | 2C | 3 | A | .... |
| 4 | .... | .... | .... | A | 11 | C | 6 | C | .... | .... | 2 | 2C | .... | .... | 3 | C | .... | A |
| 5 | .... | .... | .... | .... | 15 | 3 | 6 | A | 4 | 4 | C | 2 | 2B | .... | B | B | .... | .... |
| 6 | C | .... | .... | 2 | 7 | 7 | 7 | 5 | .... | 4 | 4 | 9 | B | .... | .... | A | .... | .... |
| 7 | 4 | .... | .... | .... | 2A | .... | .... | .... | A | 2 | 2A | 4 | .... | C | .... | .... | .... | .... |
| 8 | 12 | .... | .... | 5 | .... | 4 | .... | 4 | .... | 7 | .... | C | B | C | .... | .... | .... | .... |
| 9 | 15 | .... | .... | C | .... | C | .... | C | .... | 2 | .... | .... | 3 | .... | .... | .... | .... | .... |
| 10 | 13 | .... | 3 | A | .... | 14 | .... | 3 | .... | 6 | .... | .... | .... | .... | .... | .... | .... | .... |
| 11 | A | .... | 1 | .... | .... | 2 | .... | .... | .... | 2 | .... | .... | .... | .... | .... | .... | .... | .... |
| 12 | .... | 5 | A | B | .... | 5 | .... | .... | .... | .... | .... | 4B | .... | 5 | .... | .... | .... | .... |
| 14 | .... | 4 | 4 | .... | .... | A | .... | .... | .... | .... | .... | B | .... | 6 | .... | .... | .... | .... |
| 15 | .... | 8 | .... | .... | .... | C | .... | .... | .... | .... | .... | .... | .... | 4 | .... | .... | .... | .... |
| 16 | .... | 8 | .... | .... | .... | A | .... | .... | .... | .... | .... | A | .... | 7 | .... | .... | .... | .... |
| 18 | .... | 2 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 3 | .... | .... | .... | .... |
| 20 | .... | 13 | A | .... | .... | A | .... | .... | .... | .... | .... | .... | .... | 2B | .... | .... | .... | .... |
| 21 | .... | A | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... |
| 22 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | A | .... | .... | .... | .... |
| 24 | .... | 2 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | A | .... | .... | .... | .... |
| 25 | .... | A | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | A | .... | .... | .... | .... |
| 26 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | B | .... | .... | .... | .... |
| 30 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | A | .... | .... | .... | .... |
| **Freshman Varsities** | | | | | | | | | | | | | | | | | | |
| 1 | .... | .... | A | A | .... | A | A | .... | A | C | .... | A | .... | .... | C | .... | .... | .... |
| 2 | 2C | .... | .... | .... | 5 | C | .... | A | .... | .... | 2A | .... | A | C | 2 | 3 | A | .... |
| 3 | 3 | B | .... | .... | 8 | .... | 4 | 2 | .... | .... | .... | .... | .... | .... | C | C | .... | .... |
| 4 | 7 | 2C | 2B | 2 | C | C | 3 | 2 | .... | 6 | 2A | 4 | 4 | .... | .... | .... | .... | .... |
| 5 | 11 | .... | .... | A | 3 | 3 | .... | .... | .... | .... | .... | C | .... | .... | .... | .... | .... | .... |
| 6 | 4 | 6 | C | 2 | .... | 2 | .... | B | .... | 2 | .... | .... | .... | 4 | .... | .... | .... | .... |
| 7 | B | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... |
| 8 | .... | 3 | .... | C | .... | B | .... | .... | .... | .... | .... | .... | .... | 3 | .... | .... | .... | .... |
| 9 | .... | A | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | A | .... | .... | .... | .... |
| 10 | .... | 6 | A | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 3 | .... | .... | .... | .... |
| 12 | .... | 3 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | 2 | .... | .... | .... | .... |
| 14 | .... | A | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... |
| 16 | .... | C | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | A | .... | .... | .... | .... |
| 20 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | A | .... | .... | .... | .... |

* F—Football; BB—Basketball; H—Hockey; So—Soccer; T—Track; Te—Tennis; CC—X-Country; W—Wrestling; Gy—Gymnastics; S—Swimming; Bx—Boxing; G—Golf; L—Lacrosse; B—Baseball; IT Indoor Track Championships; TC—Outdoor Track Championships; CCC—X-Country Championships; WS—Winter Sports

# A Comparison of Two Methods of Testing Response to Auditory Rhythms

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IN AN unpublished study of factors affecting perception of auditory rhythm, made by a former University of Wisconsin graduate student,* the influences of intelligence, motor memory, auditory acuity, musical training, and motor experience on the perception of rhythm were considered. It was found that the group of students rating high on a given rhythm test excelled in all except auditory acuity and motor experience factors. Intelligence, motor memory, and musical training influenced the auditory perception of rhythm. The study was based on a group of students rating high on a written test of seventy-two rhythm patterns given with auditory stimuli and a group rating low on the same written test.

In the field of work with rhythm, one of the frequent ways of obtaining scores is by treatment of graphic, i.e., written representation of response. The question arises, would the subjects have ranked in the same order in a test based on a simple motor response to an auditory rhythm? It is possible that intelligence and training may be necessary for the particular type of response to rhythm which was used in the written test, but that they may not be related to the perception of rhythmic patterns.

Before starting a method of testing response, a review was made of the various rhythm studies that had already been carried out and this study was divided into three main divisions: (1) standardized tests for rhythmic ability; (2) apparatus that had been used in measuring rhythmic response; and (3) rhythm studies in the physical education field.

Two standardized tests of rhythm are found in the field of music, and one in a series of tests for the appreciation of literature. Dean C. E. Seashore and Kwalwasser-Dykema designed tests to determine musical talent and measure specific sensory capacities which enter into musical talent and thus contain much material irrelevant to the physical educator. In the Seashore Test for Sense of Rhythm, the subject is to tell whether two patterns given in sound by a phonograph record are alike or different. The Kwalwasser-Dykema Rhythm Discrimination Test, also given by means of the phonograph record, measures capacity to

* See bibliography, reference No. 5.

detect the presence or absence of time or intensity variation in a series of paired rhythmic patterns. The third test referred to is a test for recognition of rhythm patterns in literature, designed by Hannah Logasa and Martha Wright of the University of Chicago High School. The test for rhythm consists of ten pieces of literature to be matched with ten patterns having straight or curved lines which represent the rhythmic patterns of literature.

A review of the apparatus used in rhythm studies showed: (1) efforts to keep the stimuli consistent by the use of the metronome, phonograph records, and revolving perforated films, (2) perception of rhythm as measured by recognition or comparison of auditory stimuli, and (3) the motor response of hand or foot movements as recorded by the kymograph or revolving drum.

A number of rhythm studies have been made in the physical education field. Reference to these is made in the bibliography at the end of this article.

As stated in the opening paragraph, this study developed from results obtained in a previous study of an auditory rhythm test given to major students in the department of physical education for women of the University of Wisconsin. A wide range of scores had been made in a written test taken by students having a course in rhythmic form and analysis. The test consisted of eighteen rhythmic patterns given in sound, to be reproduced graphically in long and short dashes. An effort was made to determine reasons for the wide range in scores. Findley concluded that high intelligence and good scores on the rhythm test were related. The question arose as to whether the intelligence might not be the factor which made possible the change from auditory stimuli to graphic response.

A common response to rhythm is tapping of the hand or foot. This response is often unconscious. If the response of hand or foot could be adequately recorded, the factors involved in perception and response would be greatly reduced. Since the control of the hand is better in fine movements than the control of the foot, a record of hand movements would measure more accurately the response to rhythmic patterns.

A small machine for the recording of hand taps was built by a mechanician in the Department of Engineering. The machine was contained in a box 10″ × 8″ × 7″. Above the box was a plate depressor. The plate moved downward when tapped and returned to place when released. A three-arm lever connected with the plate was held in normal position by a spring coil. The lever had a pencil holder at the opposite end, placed in front of a revolving drum, which was mounted on a horizontal spindle. The pencil holder moved horizontally when the plate was tapped. A pencil stylus fastened into this pencil holder had a hollow tube for a piece of pencil lead, and a delicate coil inside furnished pressure against the lead piece to cause continuous pencil mark-

ing on the paper. An unmarked roll of paper was mounted on a horizontal spindle in the rear of the box. The strip of paper came forward between rollers and the drum. The two small rollers were placed to hold the strip of paper firmly against the drum. The drum was geared by a chain and driven by an electric motor. The paper moved at a rate of seven inches in ten seconds. See Figure I.

A record of a series of taps could be read easily as the duration for each tap value was marked horizontally on the paper and corresponded

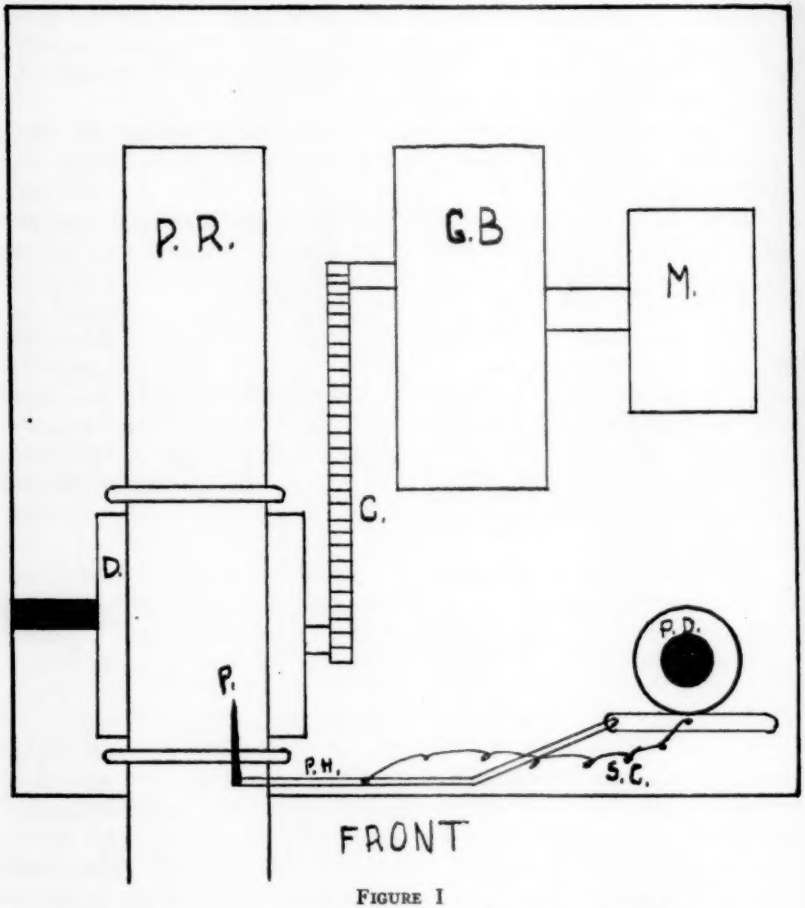


FIGURE I

M—Motor
G. B.—Gear Box
C—Chain
D—Drum
P—Pencil
P. H.—Pencil Holder
S. C.—Spring Coil
P. D.—Plate Depressor
P. R.—Paper Roll

to the symbols of long and short dashes used in the written test. A rhythmic pattern, simple or complex, of even or uneven divisions, could be tapped by an individual and simultaneously recorded by the machine pencil on the moving paper giving a picture of time intervals in pattern series that could be scored as either right or wrong.

## PROCEDURE

The written test consisted of eighteen patterns based on underlying beats of two, three, or four. It ranged from groupings of undivided beats = = to groupings of beats with even ⚍ and uneven ⚍ divisions. Each pattern was given one, two, four, and six times in the Findley study, making a total of seventy-two items. The order of the written test in this study was the same as that given in the mimeographed form used by Findley. The patterns given six times were only given three times in this study to provide for comparison with the tapping test. (See description of tapping test.)

The entire written test was given during the class hour to four classes in dancing. The tempo for the underlying beat for all groupings was moderate. The tempo was set in the mind of the administrator before giving the auditory rhythm test by listening to the regular recurring tick of a metronome giving a moderate tempo. The rhythm patterns were beaten on a wooden temple block with a wooden baton to obtain clearness and similarity of sound.

A few directions were necessary. A mimeographed form sheet was given each student. The rhythmic pattern given for each measure was to be diagramed in dashes over the underlying beats. Each pattern was given once or with repetition. The number of repetitions to be expected was announced before each pattern was given.

An effort was made to interest the groups in the experiment so as to obtain their best efforts. It was explained as a thesis study comparing a written and a tapping test of rhythm. Volunteer appointments were made for the individual tests in tapping.

For the tapping test, one-half of the written test was used. The test consisted of the same eighteen rhythmic patterns based on the underlying beats of two, three, and four. Each pattern was given twice and three times, thirty-six rhythms in all. The patterns were given in the same order as they appeared in the mimeographed form for the written test, using only those which were repeated two and three times. All patterns in the written test given once or four times were eliminated from the tapping test. In the tapping test, a pattern had to be given more than once in order that the last beat or tap in the first pattern could be measured. Since the tapping test had to be given individually, time was a factor to be considered. For this reason, the patterns were not given four times.

From the four dance classes which were given the written test, a

mixed group of thirty-five volunteers took the tapping test a week later. This group happened to be almost evenly divided between dance or physical education majors and students in other college departments. A half hour was allowed for each testing, but the average time used by an individual was twenty minutes. Each rhythm pattern was beaten in the same manner as for the written test.

The directions were: "One-half of the entire test of seventy-two rhythms will be given. All the patterns will be given with two or three repetitions. You are to tap just what you hear. Before I beat each pattern on the block, I will tell you the underlying grouping to expect and the number of times the pattern will be given, two or three. Be sure you hear the hum of the machine before you begin tapping."

The subject sat in a chair with the machine in easy access to her hand. She was allowed to tap for a few seconds on the plate depressor until familiar with the feeling of the mechanism. The administrator of the test was placed so as to be out of the vision of the subject. The administrator sat a little in back of the subject and could watch the subject and the machine. The pattern was beaten on the temple block, the current was turned on for the machine by the administrator, the subject tapped a response, and the electric current was turned off. By means of wiring, the switch was held in the administrator's left hand during the testing period.

*Method for scoring the written test:* the symbols of long and short dashes had to be given in relation to the grouping of underlying beats for each pattern as shown in the sample test sheet. Each rhythm had to be written in the one way shown for each pattern. For example, a rhythm = ⁼ = = was not scored as correct if written in any other fashion, such as = = ⁼ = ; also, a rhythm = = ⁼ was not scored as correct if written in any other order, such as = ⁼ = or ⁼ = = .

*Method for scoring the tapping test:* in order to score the tapping test, it was necessary to find some method of measuring the time relationship of the taps. Perpendicular lines were dropped from the beginning of each tap, the point where the pencil mark starts up from the base line. The interval or duration for each tap could then be measured in relation to an assumed grouping of underlying beats. The record was not read for mathematical accuracy but was expected to be correct in general proportion.

The last beat of a pattern could not be measured. In cases where the pattern was tapped correctly the first time but missed in the repetition, i.e., the second time for the pattern, an error was scored for that pattern. For example:

***right:*** — – – —·|— – – —·

***wrong:*** — – – —·|— — – – —·

Only the first two repetitions of a pattern were scored. A pattern given only once was scored incorrect; if a pattern was repeated more than twice, the third and following patterns did not affect the score.

The machine proved to be inadequate for accurate reading of intensity. The plate depressor moved easily and did not give enough resistance to make possible distinctions in the intensity of the tappings. The machine could be improved, having a larger plate for the tapping and arrangement made for the plate movement to be soundless.

Many different pattern pictures were possible. A student could tap the plate to its range limit having a picture of high vertical marks all at the same level, or release the depressor quickly, making sharp-pointed vertical marks of irregular height, or release the plate slowly making the vertical mark gradually return to the base line before the next tap. In general, the vertical mark was higher for the tap having the full beat, long value = and the mark was lower for the tap having part of a beat, short value =. Each individual was consistent in the type of pattern picture made by her tapping.

To compare the results of the two tests, a large chart was made to give a complete picture of the scores per individual and per pattern.

To study the scores made by each individual on the two tests, the coefficient of correlation was found by the Pearson product-moment method. Correlations were made between the total tapping test and the total written test, the total tapping test with the corresponding half of the written test, the total written test with the parts of the written test, and parts of the tapping test with each other.

CORRELATIONS

| | | r | P.E. |
|---|---|---|---|
| A. 1. | Tapping with whole written test | .583 | .012 |
| | Tapping with half of written test | .500 | .014 |
| 2. | Tapping, half with half (odd numbered patterns against even numbered patterns) | .590 | .012 |
| | Tapping, 2 times with 3 times | .760 | .008 |
| B. 1. | Half written with whole written | .981 | .007 |
| 2. | Patterns, once with whole written | .914 | .079 |
| | Patterns, twice with whole written | .952 | .005 |
| | Patterns, three times—whole written | .995 | .006 |
| | Patterns, four times—whole written | .979 | .003 |

The range of errors, average number of errors, and total errors for the two tests are given here.

The range of errors made in the tapping test of thirty-six rhythms was from no errors to six: 11 cases, 0 errors; 6 cases, 1 error; 2 cases, 2 errors; 8 cases, 3 errors; 1 case, 4 errors; 2 cases, 5 errors; and 3 cases, 6 errors.

The range of the errors made in the half of the written test corresponding to the tapping test was from 0 errors to 31: 9 cases, 0–4 errors; 9 cases, 5–9 errors; 0 cases, 10–14 errors; 5 cases, 15–19 errors; 5 cases, 20–24 errors; 6 cases, 25–29 errors; and 1 case, 30–34 errors.

The range of the errors made in the written test of seventy-two rhythms was from no errors to sixty-one: 7 cases, 0–8 errors; 10 cases, 9–17 errors; 1 case, 18–26 errors; 4 cases, 27–35 errors; 3 cases, 36–44 errors; 7 cases, 45–53 errors; and 3 cases, 54–61 errors.

The average number of errors made in the tapping test was two.

The average number of errors made in the half of the written test corresponding to the tapping test was thirteen. The average number of errors made in the complete written test was twenty-six.

The total number of errors made by all subjects in the tapping test was 78. The total number of errors in the corresponding half of the written test was 463 and the total number made in the complete written test was 923.

In comparing the tapping test with the written test, 3 of the 35 subjects had no errors on the tapping test but had scores of 31, 37, 39 errors, which were poor papers, on the written test. Four of the 35 subjects had 1 error on the tapping test with scores of 30, 32, 39 and 45 for the written test. One subject had 2 errors on the tapping and a total of 45 errors on the written test. In one case only did a subject have a poor tapping score and an average written score, as compared to the group. The other subjects with poor scores in tapping had poor scores in the written test. One subject had no errors on either test.

The total errors were compared for each pattern in the different series: those given once, twice, three and four times in the written test, and two and three times in tapping.

The series of eighteen rhythms in the tapping test given twice for each pattern had a total of thirty-nine errors; given three times had a total of thirty-nine errors.

The series of eighteen rhythms in the written test given once for each pattern had a total of 233 errors; given twice totaled 243 errors; given three times totaled 220 errors; and given four times had a total of 227 errors.

In comparing the patterns missed in the tapping test with the results for the same patterns in the written test, it was found that the eight patterns missed in the tap test series given two times had a total of thirty-nine errors, and had 103 errors in the written test. The nine patterns missed in the tap test series given three times had a total of thirty-nine errors in the tap test, and 120 in the written.

The eighteen patterns were ranked according to difficulty from one to eighteen, indicating patterns with the least errors on up to those patterns having the highest number of errors. In the written test there

was a gradual increase in difficulty of the patterns. In the tapping test, three patterns stand out as being the more difficult. Seven of the eighteen patterns were not missed in the tapping test. According to the difficulty table, three patterns having an even division of beats — – – and — – – – – – and — — – – were more difficult in tapping than in the written test; whereas most of the patterns having uneven divisions —· —· — — and —· —· — and —· — — were more difficult in the written test than in tapping.

Of the three patterns most difficult in the tapping test, two had the same difficulty ranking as in the written test, 16 = = = = and 18 = = = = . One pattern ranked 17th in the tap test and 6th in the written test, = = = = .

## CONCLUSIONS

From the range of errors, the averages and the total errors for the tapping test as compared with the written test, it appears that the written test is about six times more difficult than the tapping test.

Total errors in the tap test show slight difference in the scores for a pattern given two times or three times, and in the written test there is only a small difference in the scores according to the number of times a pattern was given, which indicates the two tests are reliable.

The correlations for the parts of the written test with the whole written test give evidence that a test using patterns given once, twice, three or four times only is practically as good as the long test and there is an indication that repetition one and two times is not as valid as the longer repetitions, three and four times. The correlation for the parts of the tapping test with each other is high enough to give the test reliability since the test itself was a short one. (See Ruch: *The Objective or New-Type Examination,* page 434.)

The study of the difficulty of the pattern shows that in tapping most of the patterns were relatively easy, though there was a tendency for patterns with even divisions to be the most difficult. In both tests, tapping and written, the two patterns of outstanding difficulty had a combination of the underlying beats in the one = = = = =, and in the other = = = = an even and uneven division of the underlying beat. The rankings in the written test show that even beats and even divisions seem to be easiest while uneven divisions seem to be the most difficult.

The correlation of .58 between the tap response with the written test shows that while there are common elements in the two tests they measure different factors.

Individuals making a large number of errors in the tapping test also had the most errors in the written test, whereas all the individuals making a large number of errors in the written test did not make the most errors in the tapping test, indicating that students who do well in

tapping may or may not do well in the written test, and that students who do poorly in tapping will probably be poor in a written test.

The written test, as it stands, is the more difficult and involves more factors than a test calling for the tap response. It could be used as a measure in the training of rhythmic perception. A person taking the written test needs to be trained in a scheme of graphic representation of her perception, as the written test is perhaps a measure of the individual's conscious perception of rhythm and is therefore a measure of her knowledge of rhythm in addition to her ability to perceive a pattern. It is possible that the tapping test reveals a person's ability for response to an auditory rhythm, and therefore might be used as a means of selection of those who have or have not such ability.

TABLE I

| Rhythms | Difficulty Ranking Tap Test | Half Written | Written |
|---|---|---|---|
| — — | 1–7 | 3–4 | 4 |
| — – | 13–15 | 1 | 1 |
| — · — · | 8–11 | 14–16 | 13–14 |
| — · — | 12 | 14–16 | 15 |
| — · · — | 1–7 | 8–10 | 9 |
| — — — — | 1–7 | 3–4 | 3 |
| — – — – | 13–15 | 5 | 5 |
| — · — · — · — · | 8–11 | 8–10 | 8 |
| — — · — — | 13–15 | 14–16 | 13–14 |
| — · — · — — | 1–7 | 11 | 11 |
| – – ——— — | 16 | 12–13 | 16 |
| — — — | 1–7 | 2 | 2 |
| — · — — | 1–7 | 12–13 | 17 |
| — · — · — | 1–7 | 17 | 12 |
| — — – – | 17 | 7 | 6 |
| — · · — — | 8–11 | 8–10 | 10 |
| — · — · — · | 8–11 | 6 | 7 |
| — – – — · | 18 | 18 | 18 |

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    I. Seashore's test of musical talent. Sixth record. Rhythm test. No. 53005. Columbia Phonograph Company, New York City.
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## Order of Rhythm Test

Roman numerals indicate number of times given

1-IV
2-I
3-II
4-III
5-IV
6-II
7-I
8-IV
9-II
10-III
11-I
12-II
13-III
14-I
15-IV
16-I
17-II
18-IV
19-I
20-III
21-III
22-I
23-I
24-I
25-IV
26-I
27-I
28-III
29-I
30-I
31-IV
32-III
33-II
34-III
35-IV
36-III
37-IV
38-II
39-III
40-II
41-IV
42-I
43-II
44-III
45-III
46-III
47-II
48-III
49-I
50-III
51-IV
52-IV
53-III
54-II
55-IV
56-I
57-II
58-II
59-I
60-IV
61-II
62-III
63-II
64-II
65-IV
66-II
67-IV
68-I
69-IV
70-III
71-IV
72-II

# Body-Build in Football Players

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## HISTORICAL

FITNESS for sport depends partly on anatomical build; partly on physiological stamina, speed, and skill; partly on nervous vigor, coordination, and tenacity. From both medical and physical educational viewpoints, the care of the athlete requires more facts. For an important study of function, see W. R. Miles, "Studies in Physical Exertion . . . " * The present paper treats only the anatomical aspect.

The size and proportions of various parts of the body found in certain athletes have been presumed to be of use in predicting fitness for certain sports, at least as far back as Sargent in 1887, Hitchcock in 1893, and Bemies in 1900.

For example, the notion has sporadically been suggested that vigor is greater in persons with relatively long trunks, i.e., relatively short legs. This may be tested by examination of the index Si/S (sitting height divided by stature, two measurements more commonly available and more accurately determinable than leg length). Such a test (using at that time the modification stem-length of Dreyer because I got closer duplicates than with the more usual sitting height technique; but since abandoned in favor of the latter, in order to facilitate comparison with the results of other observers, who seldom use Dreyer's technique) I published in 1923 on college oarsmen; their index was not larger, but was somewhat smaller than the controls; the difference was hardly significant, being only 2.1 times its probable error. An analogous study of relative spine length and mortality reported by the Association of Life Insurance Directors in 1924 was suggestive, but inconclusive.

Subsequent notes on the build of athletes will not be reviewed at this time, though, as a preliminary reference list, the following may be recorded: Thooris 1921 and 1924, Kleeberger 1930, and the German school up to Bach's excellent little monograph in 1930.

*Material.*—Continuing this approach to the science of sport, analysis will be made of material from three sources, for football:

1. Primarily, full and accurate anthropological measurements by a trained worker, Mr. J. G. Ayres, on the varsity and freshman football squads at the University of Chicago in 1929.

2. Statures, weights, and ages, as stated in programs sold at games played by the following varsity elevens: California, Dartmouth, Har-

* References will be found in the Bibliography at the close of the article.

vard, Southern California, and Stanford; at odd times from 1923 to 1931, mostly 1930 and 1931.*

3. Weights and ages, as stated in the *H Book of Harvard Athletics* for Harvard and Yale teams from 1880 to 1919.*

*Recorded Observations.*—The characteristic traits measured were much the most extensive and reliable for the University of Chicago series, next for the program series, and least for the book series which dates back to the infancy of the game fifty-six years ago. The units of record also differed in the various series; mine being in metric units to the *nearest* birthday, nearest millimeter, and nearest tenth of a kilogram; the others being, as nearly as I have been able to determine by correspondence, to the last or next lower birthday, inch (or in some programs half- or quarter-inch), and pound. The time of the year is assumed, in all the series, to be the latter part of the football season, late October.

In preparing the records for tabulation, therefore, the records by others were, for the sake of uniformity, subjected to the following operations:

1. Conversion of each recorded operation to the probable *nearest* value, by raising each by half the unit used in that particular series; that is, a stature recorded as 5 feet 9 inches was, if the series showed only full inches, raised to 69.5 inches; or, if the series showed some fractions of ½, raised to 69.75 inches (69.5 + 0.25); or, if the finest fraction in a series was ¼ inch, each observation was increased by an eighth of an inch.

2. Conversion of these adjusted observations into metric units: tenths of kilograms or millimeters.

3. The converted records were then tabulated in frequency tables and averaged, for comparison with the primary series. Details of the statistical methods, like details of the anthropological technique, may be found in the 1931 monograph on growth by Ayres and the writer.

*Basal Constants.*—The primary results are for the Chicago series of 109 players, aged 16 to 23 years, whose fundamental reduced parameters are shown in the Table of Constants as Table I.

* Too much reliance should not be placed on these data as they were not gathered originally for scientific purposes. They are included as being of interest as a basis of comparison and verification of results from the first group of data.

TABLE I

TABLE OF CONSTANTS

Football Players Age = 20.0 years (15.5–23.5) N = 109
University of Chicago, Varsity and Freshman, 1929. All racial stocks.
Measurements: Metric and Without Clothing

| Measurement | | Mean ± PE | | SD ± PE | | CV ± PE | |
|---|---|---|---|---|---|---|---|
| Weight in k. | W | 77.321 | .598 | 9.262 | .423 | 11.978 | .555 |
| Stature in mm. | S | 1780.229 | 4.780 | 73.990 | 3.380 | 4.156 | .190 |
| Sitting height | Si | 929.266 | 2.187 | 33.856 | 1.547 | 3.643 | .167 |
| Chest Circumf. | C | 925.000 | 3.522 | 54.520 | 2.490 | 5.894 | .270 |
| Trans. | T | 303.578 | 1.169 | 18.089 | .826 | 5.959 | .273 |
| Ant. post. | AP | 227.550 | .996 | 15.420 | .704 | 6.776 | .311 |
| Module | ChM | 267.587 | .969 | 14.999 | .685 | 5.605 | .257 |
| Shoulder Biacromial | BA | 394.339 | 1.335 | 20.661 | .944 | 5.239 | .240 |
| Pelvis Bicristal | BC | 292.321 | .860 | 13.321 | .608 | 4.554 | .208 |
| Head Length | L | 199.124 | .451 | 6.979 | .319 | 3.505 | .160 |
| Breadth | B | 155.693 | .311 | 4.821 | .220 | 3.096 | .142 |
| Height | OH | 135.216 | .329 | 5.094 | .233 | 3.767 | .172 |
| Module | CM | 163.229 | .249 | 3.857 | .176 | 2.363 | .108 |
| Face Height | MN | 127.216 | .352 | 5.456 | .249 | 4.288 | .196 |
| Breadth | BZ | 141.509 | .320 | 4.951 | .226 | 3.499 | .160 |
| Module | FM | 134.317 | .263 | 4.064 | .186 | 3.026 | .138 |
| Nose Height | NH | 56.560 | .249 | 3.854 | .176 | 6.814 | .313 |
| Breadth | NB | 36.358 | .143 | 2.220 | .101 | 6.105 | .280 |
| | W/S | 43.294 | .315 | 4.875 | .223 | 11.261 | .521 |
| | Si/S | 52.147 | .070 | 1.086 | .050 | 2.083 | .095 |
| | C/S | 52.064 | .217 | 3.365 | .154 | 6.464 | .297 |
| | T/S | 17.228 | .073 | 1.131 | .052 | 6.565 | .301 |
| | AP/S | 12.777 | .065 | 1.000 | .046 | 7.826 | .360 |
| | ChM/S | 15.005 | .060 | .931 | .043 | 6.208 | .285 |
| Above-named | BA/S | 22.127 | .070 | 1.082 | .049 | 4.891 | .224 |
| measurements | BC/S | 16.404 | .048 | .743 | .034 | 4.531 | .207 |
| in per cent of | L/S | 11.162 | .026 | .410 | .019 | 3.673 | .168 |
| Stature | B/S | 8.745 | .026 | .408 | .019 | 4.665 | .214 |
| | OH/S | 7.582 | .019 | .291 | .013 | 3.842 | .176 |
| | CM/S | 9.169 | .020 | .306 | .014 | 3.335 | .153 |
| | MN/S | 7.135 | .023 | .363 | .017 | 5.088 | .233 |
| | BZ/S | 7.947 | .025 | .382 | .017 | 4.805 | .220 |
| | FM/S | 7.546 | .020 | .316 | .014 | 4.181 | .191 |
| | NH/S | 3.143 | .016 | .250 | .011 | 7.951 | .365 |
| | NB/S | 2.043 | .009 | .143 | .007 | 6.990 | .321 |
| Index Chest | AP/T | 74.243 | .317 | 4.900 | .224 | 6.600 | .303 |
| Trunk breadth | BC/BA | 74.261 | .267 | 4.128 | .189 | 5.559 | .255 |
| Cephalic | B/L | 78.349 | .229 | 3.549 | .162 | 4.529 | .207 |
| Facial | MN/BZ | 89.913 | .311 | 4.811 | .220 | 5.350 | .245 |
| Face/Head L | MN/L | 63.872 | .210 | 3.257 | .149 | 5.099 | .234 |
| Face/Head B | BZ/B | 90.936 | .174 | 2.700 | .123 | 2.969 | .136 |
| Nasal | NB/NH | 64.573 | .397 | 6.148 | .281 | 9.520 | .439 |

*Age.*—The age to nearest birthday showed the following frequencies:

| Age | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | Total |
|---|---|---|---|---|---|---|---|---|---|
| f | 1 | 4 | 15 | 29 | 21 | 14 | 14 | 11 | 109 |

From this distribution the constants calculated were: mean = 20.0 years ± .107 (its probable error), sigma = 1.66 ± .076, and coefficient of variation = 8.31 per cent ± .38.

Growth at the successive ages seems, in view of the small frequencies, not worth mathematical analysis for all the traits; but such marked growth is obvious from the averages for the 15 players of ages 17.5–18.5 years, to the averages for the 29 players aged 18.5–19.5 years, that these means are put on record in Table II.

TABLE II

TABLE OF MEANS AT AGES 18 VS. 19

Football Players, University of Chicago, All Racial Stocks

| Measurement Metric and without clothing | | Age 17.5–18.5 N 15 | | Age 18.5–19.5 N 29 | |
|---|---|---|---|---|---|
| | | M | PE | M | PE |
| Weight in k. | W | 70.6 | .75 | 78.5 | 1.52 |
| Stature in mm. | S | 1754.3 | 10.51 | 1783.6 | 6.80 |
| Sitting height | Si | 919.3 | 5.68 | 930.7 | 3.73 |
| Chest Circumf. | C | 886.3 | 6.95 | 923.6 | 7.11 |
| Trans. | T | 288.7 | 2.48 | 303.1 | 2.10 |
| Ant. post. | AP | 221.0 | 1.44 | 227.7 | 2.27 |
| Module | ChM | 257.3 | 1.41 | 267.6 | 1.93 |
| Shoulder Biacromial | BA | 383.7 | 3.88 | 395.3 | 2.38 |
| Pelvis Bicristal | BC | 288.0 | 2.10 | 290.1 | 1.81 |
| Head Length | L | 195.4 | 1.10 | 198.8 | .75 |
| Breadth | B | 155.0 | .73 | 155.5 | .62 |
| Height | OH | 135.7 | 1.09 | 135.7 | .59 |
| Module | CM | 162.8 | .81 | 163.2 | .43 |
| Face Height | MN | 128.5 | .88 | 127.1 | .79 |
| Breadth | BZ | 140.9 | .95 | 141.9 | .71 |
| Module | FM | 134.6 | .71 | 134.4 | .59 |
| Nose Height | NH | 57.3 | .68 | 55.4 | .49 |
| Breadth | NB | 35.4 | .37 | 36.0 | .27 |
| | W/S | 40.1 | .40 | 43.9 | .86 |
| | Si/S | 52.4 | .19 | 52.3 | .12 |
| | C/S | 50.6 | .40 | 51.8 | .46 |
| | T/S | 16.7 | .12 | 17.2 | .14 |
| | AP/S | 12.6 | .14 | 12.8 | .14 |
| | ChM/S | 14.7 | .08 | 15.0 | .12 |
| Above-named | BA/S | 21.9 | .19 | 22.2 | .13 |
| measurements | BC/S | 16.5 | .12 | 16.3 | .11 |
| in per cent of | L/S | 11.1 | .06 | 11.1 | .04 |
| stature | B/S | 8.9 | .06 | 8.7 | .05 |
| | OH/S | 7.7 | .04 | 7.6 | .04 |
| | CM/S | 9.3 | .04 | 9.2 | .03 |
| | MN/S | 7.4 | .04 | 7.1 | .05 |
| | BZ/S | 8.0 | .06 | 8.0 | .05 |
| | FM/S | 7.7 | .04 | 7.5 | .04 |
| | NH/S | 3.2 | .04 | 3.1 | .03 |
| | NB/S | 2.0 | .02 | 2.0 | .02 |
| Index Chest | AP/T | 75.7 | .84 | 74.3 | .68 |
| Trunk breadth | BC/BA | 75.4 | .83 | 73.5 | .50 |
| Cephalic | B/L | 79.5 | .54 | 78.4 | .46 |
| Facial | MN/BZ | 91.4 | .73 | 89.1 | .73 |
| Face/Head L | MN/L | 65.7 | .46 | 63.6 | .46 |
| Face/Head B | BZ/B | 90.7 | .57 | 91.3 | .31 |
| Nasal | NB/NH | 62.1 | 1.13 | 65.2 | .80 |

The difference between the averages for central age 18 and age 19 was next tabulated; for each trait the change was divided by its probable error $\sqrt{(E_1)^2 + (E_2)^2}$, and the quotient or critical ratio was taken as statistically significant when it was 2.5 or more. By this method, the 19 year group was shown materially smaller in the relation of face-length to head length (MN/L), and larger in the following:

| W | C | T | AP | ChM | BA | L | W/S | MN/L |
|---|---|---|---|---|---|---|---|---|
| 4.6 | 3.7 | 4.4 | 2.5 | 4.3 | 2.5 | 2.5 | 4.0 | −3.2 |

These significant changes between 18 and 19 in football players is of interest because a similar comparison between the same two ages in private school boys shows increases which are so slight as not to be mathematically significant. In other words there is an association between playing football and continuance of development.

The question then arose whether to omit the boy aged 16 and the four aged 17 on the assumption that approximately full growth is generally reached at 18 or 19. "Approximately" is used advisedly, because workers in Pearson's laboratory have shown that growth reaches its limit or prime at different ages for different traits, and often only after the twentieth year. On comparing each trait for the above five youngest subjects with the mean of the whole series, it did turn out that one of them was small, in fact the 16 year old; but the four 17 year olds were such big fellows that their measurements seemed to compensate for the 16 year subject. These 5 subjects were accordingly not cut out of the principal table of constants given above for the entire group of 109.

*Comparison with Adults.*—As a series of non-athletic adults, though unfortunately not of the same racial mixture nor social status, I took next a group of 281 white male convicts aged 20–30 years, in the penitentiary at Joliet, Illinois, measured largely by J. G. Ayres, partly by myself. Although the convicts' average age was 24.9 years, that is, much closer to prime, they were, as anticipated, exceeded by the athletes in absolute size of the several traits. For relative measurements and indices however a distinction was notable: the football players had nearly uniformly *smaller* values, that is, less stocky. These lower relative values I attribute to their taller stature (itself due to taller racial and economic categories), which tallness dominated over their huskiness in affecting the values relative to stature. This is a distinction from the findings at the end of a preceding paragraph for private school controls. The calculations are omitted.

*Race.*—The possible effect of racial stock on size of the players can, like age effect, be unsatisfactorily analyzed on such small numbers. The best that could be done however was to divide the players aged 18–23 into four racial groups:

I. Four grandparents born in the United States.

II. Jewish stock.

III. Three or 2 grandparents born in the United States, but other 1 or 2 born in N.W. Europe.

IV. Only 1 or 0 grandparents born in the United States, but others born in N.W. Europe.

Examination by the common method, critical ratio of each difference to its probable error, affords only a rough estimate, because the numbers are so small. A ratio larger than 2.5, however, is taken to indicate that Group I is significantly bigger than Group II in stature, sitting height, head length, head height, and statistically smaller in weight absolute and relative to stature, chest circumference absolute and relative, relative chest breadth and depth* and module,* relative pelvic breadth, head breadth absolute and relative, face breadth absolute and relative, nose height absolute and relative, cephalic index. In other words, Jews in like environment are as large as so-called old Americans.

Or if Old Americans (all 4 grandparents born in this country) be compared with Group IV (3 or 4 grandparents born in Northwestern Europe), the former are statistically larger in head height; and less in absolute face breadth, chest size relative to stature* (Ch M/S), and cephalic index. These differences are attributable to probable greater amount of northern racial stock in the hybrid mixture of the former; for extensive mixture exists even when one seeks homogeneity.

Of the means, probable errors and computations, I reproduce only a few as illustrations in Table III.

TABLE III

RACE DIFFERENCES IN VARIOUS TRAITS

| | I | | II | | III | | IV | |
|---|---|---|---|---|---|---|---|---|
| | Old American N—24, A—20.1 | | Jews N—27, A—20.0 | | 1 or 2 gps. were N.W. European N—19, A—20.1 | | 3 or 4 gps. were N.W. European N—25, A—20.4 | |
| | M | ± PE | M | ± PE | M | ± PE | M | ± PE |
| W | 76.0 | 1.2 | 79.9 | 1.1 | 73.9 | 1.5 | 78.4 | 1.0 |
| S | 1802 | 8.8 | 1764 | 8.3 | 1783 | 10.3 | 1791 | 7.8 |
| Si | 938 | 4.2 | 923 | 4.6 | 931 | 4.2 | 932 | 3.8 |
| C | 916 | 7.0 | 944 | 6.3 | 903 | 8.9 | 939 | 6.3 |
| L | 202 | 0.7 | 199 | 0.9 | 199 | 1.1 | 200 | 1.0 |
| B | 154 | 0.6 | 157 | 0.5 | 155 | 0.8 | 156 | 0.7 |
| OH | 137 | 0.6 | 134 | 0.7 | 137 | 0.9 | 135 | 0.5 |
| BZ | 139 | 0.7 | 142 | 0.6 | 141 | 0.7 | 142 | 0.6 |
| NH | 55.8 | 0.5 | 58.6 | 0.4 | 56.7 | 0.6 | 55.5 | 0.4 |
| B/L | 76.5 | 0.4 | 79.1 | 0.4 | 77.9 | 0.6 | 78.3 | 0.4 |

*Comparison with Private School Boys.*—To get a fair-sized series of approximately similar racial stock and economic advantage, I have consolidated the distributions which in the private school monograph were reported separately for central ages 18 and 19, and for the 181 boys between 17.5–19.5, average age 18.5 years, recomputed means and

* The above differences between race groups in football men confirm the differences found for the same groupings among private school boys by Ayres and myself for the items starred.

their probable errors. Although these private school boys are, I believe, the largest of their age so far reported anywhere, the comparison showed them, as would be expected, to be surpassed by the 109 football players. The differences and critical ratios are in Table IV. The excess existed for the measurements of absolute size; and also for the traits referred to stature, which means that though eleven millimetres taller, the footballers were burly enough to maintain their relative measurements larger than controls of similar racial and economic categories.

TABLE IV

COMPARISON OF 109 FOOTBALL PLAYERS AGE 16–23 WITH MEANS FOR 181 PRIVATE SCHOOL BOYS AGE 17.5–19.5

| | | Private School Mean | PE | Diff. | Diff. / PE |
|---|---|---|---|---|---|
| Weight in k. | W | 66.5 | .47 | 10.8 | 14.3 |
| Stature in mm. | S | 1762.6 | 3.16 | 17.6 | 3.1 |
| Sitting height | Si | 918.6 | 1.57 | 10.6 | 3.9 |
| Chest Circumf. | C | 878.3 | 3.13 | 46.7 | 9.9 |
| Trans. | T | 305.3 | 1.53 | —1.8 | —0.9 |
| Ant. post. | AP | 209.8 | .90 | 17.7 | 13.2 |
| Module | ChM | 257.3 | 1.10 | 10.3 | 7.0 |
| Shoulder Biacromial | BA | 391.9 | .93 | 2.5 | 1.5 |
| Pelvis Bicristal | BC | 277.7 | .75 | 14.6 | 12.7 |
| Head Length | L | 195.6 | .35 | 3.6 | 6.3 |
| Breadth | B | 152.6 | .30 | 3.1 | 7.2 |
| Height | OH | 131.3 | .31 | 4.0 | 8.8 |
| Module | CM | 160.4 | .26 | 2.8 | 7.8 |
| Face Height | MN | 123.4 | .33 | 3.8 | 7.8 |
| Breadth | BZ | 136.8 | .26 | 4.8 | 11.5 |
| Module | FM | 130.8 | .25 | 3.5 | 9.5 |
| Nose Height | NH | 55.0 | .18 | 1.6 | 5.1 |
| Breadth | NB | 34.7 | .12 | 1.7 | 9.1 |
| | W/S | 37.1 | .18 | 6.2 | 17.1 |
| | Si/S | 52.2 | .07 | —0.1 | 0.5 |
| | C/S | 49.9 | .18 | 2.1 | 7.6 |
| | T/S | 17.3 | .09 | 0.1 | 0.4 |
| | AP/S | 11.9 | .05 | 0.9 | 10.8 |
| | ChM/S | 14.6 | .06 | 0.4 | 4.4 |
| Above-named | BA/S | 22.3 | .05 | —0.1 | 1.4 |
| measurements | BC/S | 15.8 | .05 | 0.6 | 8.7 |
| in per cent of | L/S | 11.1 | .02 | 0.1 | 1.4 |
| stature | B/S | 8.7 | .02 | 0.1 | 2.1 |
| | OH/S | 7.5 | .02 | 0.1 | 4.7 |
| | CM/S | 9.1 | .02 | 0.1 | 3.5 |
| | MN/S | 7.0 | .02 | 0.1 | 4.3 |
| | BZ/S | 7.8 | .02 | 0.2 | 5.4 |
| | FM/S | 7.4 | .01 | 0.1 | 5.8 |
| | NH/S | 3.1 | .01 | 0.1 | 0.6 |
| | NB/S | 2.0 | .01 | 0.1 | 5.7 |
| Index Chest | AP/T | 69.2 | .31 | 5.1 | 11.4 |
| Trunk breadth | BC/BA | 71.0 | .19 | 3.2 | 9.8 |
| Cephalic | B/L | 78.2 | .19 | 0.2 | 0.5 |
| Facial | MN/BZ | 90.1 | .26 | —0.2 | 0.5 |
| Face/Head L | MN/L | 63.1 | .17 | 0.7 | 2.7 |
| Face/Head B | BZ/B | 89.6 | .12 | 1.3 | 6.1 |
| Nasal | NB/NH | 63.4 | .30 | 1.2 | 2.4 |

*Comparison with Other Athletes.*—Compared with football men from other parts of this country, pooled in the program series, the Chicago players were lighter and shorter, presumably owing to inclusion of freshmen.

For athletes of another racial stock, some comparable data are to be found in Leipold's paper on the Bavarian Turnfest in Bamberg in 1926. Since football did not figure among the events, we may select the biggest averages from his gymnastic groups. The Chicago football men were larger in the first three characteristics, but the difference is statistically significant only for absolute sitting-height.

| | | Leipold's Bavarians Field Athletes | Chicago Football | Program Series Football |
|---|---|---|---|---|
| | | N—90 | N—109 | N—397 |
| | | Age unknown | A 20.0 ± .11 | A 21.5 ± .05 |
| Weight | W | 69.4 kg. ± 1.0 | 70.6 kg. ± 0.8 | 82.3 kg. ± 0.2 |
| Stature | S | 1748 mm. 6.4 | 1754 mm. 10.5 | 1822 mm. 1.9 |
| Sitting height | Si | 898 mm. 2.1 | 919 mm. 5.7 | |
| Index | Si/S | 54.2% | 52.4% 0.2 | |

*Secular Trend.*—With the passage of years since 1880, some changes in characteristics of football players are worth noting.

Age, as expected from the known increase of graduation age, has tended to rise, particularly during the period from November, 1900–November, 1909, inclusive for Harvard and Yale men. Curiously enough, the program series average was not 21.8 years as expected from the H-Y nearest (1900–1919) figures, but 21.5 years; this slight turn of the tide toward youth is statistically significant, but may be due to casualness of statement on the part of some uninterested players. The distinctly lower average for the Chicago series is no doubt due to inclusion of the freshman as well as the varsity team, and accordingly is not comparable.

Weight paralleled age upward from 1880 till about 1909, then there was some recession for the decade 1910–1919. The program series (1923–31) showed an average close to what would be anticipated by averaging the last two decades (1900–1919). Again, as for age, the Chicago series showed weight distinctly lower than the foregoing series, as expected from their being a year and a half younger.

Stature in man during the past has been shown to exhibit a considerable secular increase (see for instance Gray 1927, Bowles 1932). In the decade series stature, unfortunately, was not recorded. The Chicago series was 41 ± 5 mm. shorter than the program series; this difference is amazing because unexplained by age or similar trend. That is, ordinarily with increase in age from 18.5 to 20.0 years the gain in height is, for a group average, probably not more than 10 mm. and secular trend between these two series is trivial.

TABLE V

EFFECT OF SECULAR TREND ON FOOTBALL PLAYERS

| Series | Date | N | Age in years | | Weight net, in k. | | Stature net, in mm. | |
|---|---|---|---|---|---|---|---|---|
| | | | Mean | PE | Mean | PE | Mean | PE |
| Harvard-Yale (Varsity) | 1880–89 | 99 | 21.26 | ± .11 | 73.3 | ± .43 | | |
| | 1890–99 | 213 | 21.35 | .08 | 78.8 | .39 | | |
| | 1900–09 | 220 | 21.86 | .07 | 83.9 | .43 | | |
| | 1910–19 | 176 | 21.82 | .06 | 81.8 | .35 | | |
| Programs (Varsity) | 1923–31 | 362 | 21.51 | .05 | 82.3 | .22 | 1821.5 | ± 1.86 |
| Chicago (Varsity and Freshman) | 1929 | 109 | 20.00 | .11 | 77.3 | .60 | 1780.2 | 4.78 |

*Position on team and build.*—The relation between the position played and build may now be studied by arranging, for each characteristic, the means for the several positions in order of increasing size. Age varied very slightly. Weight increased in successive positions, and significantly so, except perhaps guard versus tackle, the latter being only 1.1 k. heavier or 2.1 times the probable error of that difference. These men were the heaviest, not the centers. Stature increased in successive positions also, but not in the same order as for weight; the main shift being for ends, who were lighter than centers and guards, but taller than both; it is noteworthy that they were taller than centers by only a trifling margin of 3 mm. If weight and height together be taken as a rough criterion of mere physical power, these measurements give the two tackles a very special characterization. The pertinent means, from the program series, are arranged in Table VI.

TABLE VI

POSITION ON ELEVEN AND BUILD

| Age | | | Weight | | | Stature | | |
|---|---|---|---|---|---|---|---|---|
| Years | | Position (N) | Kg. | | Position | Mm. | | Position |
| 21.39 | ±.14 | Quarter (35) | 76.1 | ±.75 | Quarters | 1768.9 | ±5.5 | Quarter |
| 21.41 | .13 | End (64) | 78.4 | .33 | Other backs | 1806.7 | 3.1 | Back |
| 21.44 | .16 | Center (35) | 81.1 | .36 | Ends | 1816.0 | 3.3 | Guard |
| 21.52 | .08 | Back (108) | 83.3 | .47 | Centers | 1841.4 | 4.8 | Center |
| 21.62 | .16 | Guard (57) | 87.1 | .43 | Guards | 1844.8 | 3.1 | End |
| 21.63 | .13 | Tackle (63) | 88.2 | .32 | Tackles | 1877.3 | 3.3 | Tackle |

## SUMMARY

Body-build studies in the past have often been fruitless because subjects have been unselected and series called representative when more nicely they should be termed badly heterogeneous. To make progress in this topic of constitutional differences, often too slight to be spotted by the eye or by the critical ratio test, and manifest only on scrutiny of trends, one ought to select sub-groups ever more limited,

with specifications of the setup. Such attempts are made here for football players. The number of individuals is 1179 (three main series of 109, 362, 708); the characteristics recorded are 42 in number, and are treated with regard to age, race, similar economic status of like race (private school boys), adults, other athletes, secular trend, and position on the team.

*Age-effect.*—For athletes in the later teens, age should be considered because the football players showed such definite growth from 18 to 19 years. This phenomenon is to be remarked in contrast to the slight changes usually noted in young people at this period of life, for example, private school boys. The explanation offered is the effect of regular exercise.

Compared with non-athletic adults, though unfortunately not of the same race mixture nor social status (white convicts at Joliet, Illinois), the footballers were absolutely larger, but smaller relative to stature. This lesser stockiness is due to the factor of greater tallness manifesting itself more vigorously than their greater huskiness.

*Race-effect.*—Four racial groups were compared and several differences were indicated. The most important was that, given like economic care during childhood, Jews were as large and well-developed as Gentiles. This confirms our earlier conclusions on private school boys.

Compared with German athletes, as near alike as available in the literature, the footballers were heavier and taller.

*Controls of like race and social status.*—Private school boys, who like college men form a highly selected group, were not so big as the football players. The causes were presumably: (1) age of boys a year and a half lower, (2) high selection of athletes, (3) training and exercise.

*Effect of athletics.*—In young men of similar age, race, and economic status, the football players were larger both in absolute measurements, and also in the same characteristics with stature kept constant.

*Secular trend.*—With the passage of time since the early days of the game in 1880, football players have on the whole tended to increase in age, weight, and height.

*Position played.*—The centers were lighter than the guards and tackles. The ends were practically no taller than the centers. The tackles averaged both the heaviest and tallest of all.

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# A New Device for Urinalysis in the Routine Health Examination

By HARRY A. SCOTT, Ph.D.
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AS IN most institutions of higher learning, the Department of Physical Education at The Rice Institute conducts a complete health examination of all entering male students. This examination is completed during the first few days of school and each student is rated according to his physical fitness to carry (*a*) a normal program of physical activities and (*b*) a normal academic load. Students with defects of a serious nature are assigned to individual physical education programs if this is deemed advisable and every attempt is made to follow up the findings of the examination by cooperating with the parents and the student to bring about the desired correction. Subsequent reexaminations of the subnormal group at short intervals enable the department to maintain a close check on the effects of exercise or study, as the case may be, upon the defect.

The team method of examination is employed; that is, a number of physicians conduct the examination by each taking care of some specific part of the whole. The student passes from doctor to doctor carrying with him his examination form, upon which is recorded the finding of each examiner. At the end of the line is stationed the school physician who summarizes the findings of the individual doctors and rates the student as indicated in the preceding paragraph.

The various stations through which the student passes are as follows:

1. Collection of the urine sample.
2. Obtaining a basket and gymnasium uniform assignment.
3. Filling out the necessary information on the examination form.
4. Disrobing.
5. Weighing, measuring, and observing general development, etc.
6. Recording the pulse rate before and after exercise.
7. Examining the eyes.
8. Examining the teeth.
9. Examining the ears, nose, and throat.
10. Examining the chest, abdomen, etc.
11. Classification and physical education class assignment.

Prior to the fall of 1935–36 the urinalysis was conducted in the customary manner. The sample was collected, the specific gravity determined and the litmus test made, and the ordinary test made for sugar and albumen. This process required from seventeen to twenty minutes

for each sample. While it was possible under this method to supply the doctor at the last station with information concerning the urinalysis before the student reached that station it required a fairly large staff of technicians and considerable effort was necessary to keep ahead of the line. In this connection it might be mentioned that physical education major students were taught how to conduct the urinalysis and they acted as technicians in these examinations.

This fall (1935–36) the matter of urinalysis has been considerably simplified by the use of a machine designed for this purpose (Figure 1) which has recently been perfected in the laboratories of The Rice Institute. Two Houston, Texas, physicians, Drs. Peyton Barnes and John B. Rushing have collaborated in perfecting this ingenious device which was originally intended to be placed in public lavatories. Upon placing a coin in a slot, and passing a sample of urine in an especially designed cup, the machine automatically analyzes the urine to determine the presence or absence of albumen or sugar. This machine, which is called the "Detector," is scientifically accurate. It has been presented to the field of medicine in an entirely ethical manner and has been accepted by the profession as a valuable aid in detecting kidney ailments and their various complications and making possible an early treatment of the condition.

In its operation the sample is automatically drawn up into the machine. On one side the Heller's Nitric Acid Test for albumen is made and on the other the sample is mixed with a Benedict's Solution where an automatic heating unit boils the mixture and thus tests it for sugar. While the test is not accurately quantitative, it does give some idea as to the quantity of sugar or albumen present by means of comparing the precipitates in the machine with an adjacent graduated chart. After the sample has been tested the machine flushes itself thoroughly and is ready for the next sample. The entire operation requires but two minutes.

In adapting the "Detector" to the requirements of the routine educational health examination a few changes were necessitated. A machine was constructed with electrical switches in place of the coin slot. The student passes a sample in a jar. Its specific gravity is determined and the litmus test made in the ordinary manner. The sample is then poured into the cup at the end of the tube (Figure 1), the electrical contact made, and the automatic operation started as described above. If the sample contains either sugar or albumen the student is instructed to return within two days for another urinalysis. The results are recorded by the attendant on the examination record of the student and he passes on to the next station. If sugar or albumen is present at the second examination the student is referred to the school physician for consultation and a more exhaustive examination if indicated.

The importance of urinalysis in the routine health examination can-

not be over-estimated. While both sugar and albumen may be present in the urine at any time they are not present at all times. If either or both are present at all times it is a matter of grave concern which requires immediate corrective measures. Sugar appears in the urine of persons having diabetes mellitus, but the disease is one of the pancreas and not of the kidneys. The pancreas secretes insulin, which the body must have in order to use sugar and starch. Diabetes mellitus is a disease of metabolism caused by degenerative changes in the Islands of Langerhans.

In this disease, when one eats sugar it is not utilized because of the lack of the essential quantities of insulin. The sugar, in the form of glucose, then begins to accumulate in the blood stream. After it reaches a certain concentration it begins to pass through the kidneys and appear in the urine. When it makes its appearance in the urine the first chance of detecting the disease is at hand. Cases vary in their severity, and one may have diabetes for a long time without knowing it, hence the routine urinalysis in the health examination.

Albumen is among the many necessary constituents of the blood stream for it is from its presence in the circulating plasma that the body tissues build up their worn-out parts. This albumen is constantly being replaced by the food which is eaten, providing it is not lost in some manner. Normally the blood passes through the kidneys many times a day and from it are strained the various waste products and excess salts which are passed off as normal excretions. The substances in the plasma which are useful to the body, such as albumen, are not normally found in the urine. However, if the kidneys are inflamed or diseased in any way this albumen may be allowed to pass through the kidneys and be excreted in the urine. Thus the body would be constantly losing material which normally would be converted into body tissues. Mild inflammation of the kidneys may exist for a long time without the individual's knowledge. If this inflammation becomes chronic it is known as Bright's Disease. The insidiousness of its onset and the slowness with which it develops are its great dangers, because kidney tissue once destroyed is never replaced—it is lost forever.

The "Detector" machine is so simple that it requires no specially prepared operator. The only physical requirements are running water of a constant pressure, a drain, and an ordinary electrical outlet. The results are accurately and quickly determined, thus enabling the student to conclude the entire health examination without the necessity of waiting for the results of the urinalysis as was formerly the case. Moreover, the mechanical operation of the machine is interesting to the students and they are impressed with the importance of urinalysis in maintaining a healthy condition of the body. The machine lends itself to frequent examination of the urine and thus makes it easy to keep a close check on the health of those who need it.

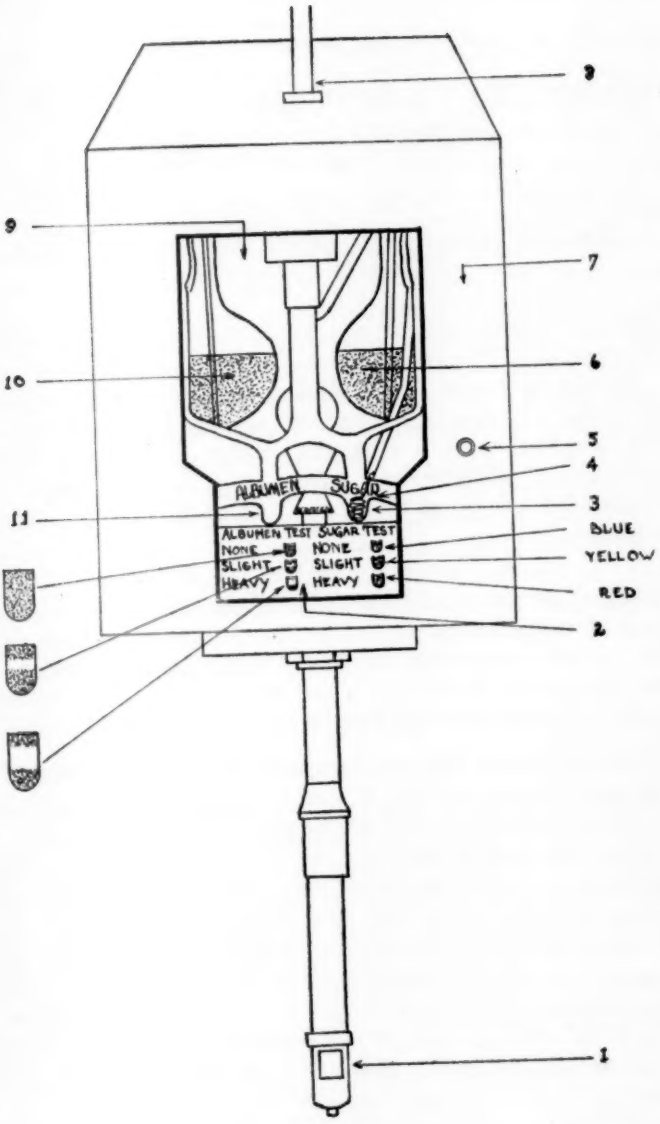


FIGURE 1.

1. Sample collected here
2. Comparative chart
3. Completed sugar analysis appears here
4. Electrical heating coils
5. Electrical switch to start machine
6. Benedict's Solution
7. Monel Metal case
8. Water connection
9. Plate glass over opening
10. Heller's Nitric Acid solution
11. Completed albumen analysis appears here

# An Analysis of Activity Records of Field Hockey Players

By Anna Espenschade

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FIELD hockey is one of the most strenuous games played by girls and women. The field is large, the playing period long, and the activity continuous. The team is composed of eleven members, each having specific, though in many respects similar, duties to perform. No studies have been made to determine whether or not all positions with the exception of goalkeeper are equally strenuous. The demands of the various positions in terms of distance and speed have been considered in this study.

## PURPOSE

The purpose was to determine the distances traveled and the rate of speed of movement of players in the various positions of the field-hockey team. It was necessary to limit the study to five positions. Those chosen were center forward, right and left halfback, right and left fullback. Some of these positions were studied more thoroughly than others.

## TECHNIQUE AND RELIABILITY OF MEASUREMENT

Records* were taken from a terrace beside and approximately ten feet above the level of the field. The field was a turf field, ninety-nine by fifty yards. The records were made by tracing the path of a player on a miniature field made to the scale of eleven yards to the inch. Field patterns were carefully drawn on stiff cardboard and fixed to a drawing board. Onion-skin paper was superimposed on this base and the path of the player for a three-minute period was traced in pencil on this paper. The three minute interval was chosen after some experimentation, first, because it was the longest time period practical for making legible records, and second, because it divided the official sixty-minute game into a convenient number of parts.

In addition to tracing the path of the player, the recorder indicated by a small circle on the record each time the player under observation hit the ball. At the same time, the recorder held a stop-watch and measured the number of seconds during the three-minute period in which the player under observation stood still. This time was recorded on the record sheet. Thus each record sheet furnished the following informa-

* All of the records used in this study were taken by Mildred Martin and by Mae Moore, graduate students in physical education at the University of California. The writer takes this opportunity to thank them for their contributions.

tion: name and position of player, date, path of player, number of times the ball was played, number of seconds rested.

In order that this information should be as accurate as possible, considerable practice in taking records was necessary. Agreement within 5 per cent of the total distance and time for records made simultaneously by two skilled people was taken as a satisfactory criterion of accuracy. After four weeks of consistent practice, forty-five minutes of records taken by two people showed an average deviation from the mean in time of 1.6 per cent; in distance of 5.4 per cent. Two months later, fifty-four minutes of records showed an average deviation in time of 9.0 per cent; in distance of 4.1 per cent. These latter records were continuous for distance throughout entire playing periods. This continuity of distance-record was obtained at some sacrifice in accuracy of resting time. The actual variation per record in time averages approximately three seconds and in distance approximately six yards.

Over seven hundred records were taken, of which some five hundred were used in this study. Each record was measured† at least four times and by two different students who were trained in the technique. If the variation in result of measurement exceeded 5 per cent of the total, additional measurements were made. An average of the measurements made was used. The average variation in measurement for one hundred records selected at random was less than 1 per cent.

## SELECTION OF PLAYERS FOR STUDY

The individuals studied were chosen from players in elementary hockey classes and from class teams in the Women's Athletic Association at the University of California, and from members of Club teams of the Northern California Field Hockey Association in the Fall of 1932. Record taking for beginning players was unsatisfactory, especially at the first of the season, because of constant interruption of play for coaching. The W.A.A. players were all coached by the same person but the club players present a variety of coaching background.

The number of different individuals studied was not great, but the same individuals were observed under varying conditions of practice and play. (See Table I.)

TABLE I

NUMBER OF INDIVIDUALS STUDIED AND OF RECORDS MADE

| *Group* | Position C.F. | | R.H. | | L.H. | | R.F. | | L.F. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Ind.* | *Rec.* | *Ind.* | *Rec.* | *Ind.* | *Rec.* | *Ind.* | *Rec.* | *Ind.* | *Rec.* |
| Club | 4 | 92 | 5 | 64 | 3 | 31 | 3 | 57 | 1 | 4 |
| W.A.A. | 4 | 52 | 5 | 31 | 4 | 36 | 5 | 51 | 1 | 4 |
| Beginners | 4 | 38 | 3 | 15 | 1 | 9 | 1 | 11 | 4 | 13 |

† By means of a Measurer of Curves, Leitz Company.

Each of these players was an average or better than average performer within her own group. Rated on an absolute scale of excellent§—good—fair—poor, the club players would in general rate "good," the W.A.A. players, "fair," and the beginners, "poor."

In order to determine accurately the relative demands in terms of distance and speed which are made by the game of field hockey on players in the various positions, it would be highly desirable to study the performances of players of recognized outstanding ability. This study can only present results from a cross-section of players in one locality.

## DISTANCES TRAVELED BY PLAYERS

The distances traveled by players in the various positions are given in Table II.

TABLE II

DISTANCES TRAVELED PER THREE-MINUTE-PERIOD

| | | C.F. | R.H. | L.H. | R.F. | L.F. |
|---|---|---|---|---|---|---|
| Club | Range ... | 147–349 | 172–411 | 152–421 | 115–390 | 214–325 |
| | Mean .... | 248.2 | 286.3 | 263.3 | 242.3 | 248.3 |
| | Sigma ... | 46.35 | 59.08 | 59.80 | 58.80 | * |
| W.A.A. | Range ... | 129–412 | 131–420 | 121–362 | 66–409 | 121–346 |
| | Mean .... | 270.0 | 273.2 | 257.2 | 216.7 | 229.1 |
| | Sigma ... | 66.80 | 63.83 | 58.40 | 71.40 | * |
| Beginners | Range ... | 146–389 | 180–277 | 248–309 | 60–237 | 142–203 |
| | Mean .... | 268.7 | 246.9 | 213.5 | 159.1 | 177.1 |
| | Sigma ... | 52.40 | * | * | * | * |

* Not calculated because of insufficient data.

For Club players, the fullbacks and halfbacks show greater variation in distances covered in 3 minutes than do center forwards. The average distance traveled by center forwards and by right and left fullbacks is approximately equal, however—about 245 yards per 3 minutes. Both halfbacks travel greater distances, the left half averaging 263 yards and the right halfback covering the greatest distance of all, 286 yards.

For W.A.A. players, the right fullback shows the greatest variation in distances, the center forward and right half show a smaller variation and the left half shows the least variation. The greatest average distances covered are by the right half (273 yards) and the center forward (270 yards). The left half averages 257 yards and the right fullback only 216 yards in a 3-minute period.

For beginning players, the number of records for all positions except center forward is very small. The figures obtained show that the center forward covers the widest range and travels the greatest average distance, 269 yards. Then follow in order the right half with an average of 247 yards, the left half with 214 yards, the left fullback with 177 yards, and the right fullback with 159 yards.

§ Members and reserves of the U.S.F.H.A. team.

The distances covered by defense players maintain the same order in all groups. That is, the right half travels the greatest distance, followed by left half, left fullback, and right fullback. The Club center forwards travel a distance equal to the smallest average distance covered by any Club player, while W.A.A. and beginning center forwards travel approximately the greatest average distance for their groups. There is some evidence to show that Club center forwards play their own position more consistently than do the less skilled center forwards. (See below.) This may account for the smaller distance covered by the Club center forwards. It is interesting to note the difference in average distance covered by Club and W.A.A. right fullbacks, also. The more expert Club player covers a much greater distance than does the W.A.A. player. This may be explained by the fact that the less skilled fullback is apt to play close to her own goal in a purely defensive position.

Table III gives the reliability of the differences in average distance covered. Of course, the factor of selection of cases must enter in. Since the number of different individuals studied for any one position is small it is possible that they do not form a typical sample and so the results may not be universally true.

TABLE III

RELIABILITY OF THE DIFFERENCE

| Group | Positions | $\frac{D}{\sigma \text{ diff.}}$ * | Chances in 100 of a true difference* |
|---|---|---|---|
| Club | R.H. > C.F. | 4 | 100 |
| | R.H. > R.F. | 4 | 100 |
| | R.H. > L.H. | 1.9 | 97 |
| | L.H. > R.F. | 1.6 | 94 |
| | L.H. > C.F. | 1.2 | 88 |
| W.A.A. | C.F. > R.F. | 3.8 | 100 |
| | R.H. > R.F. | 3.7 | 100 |
| | L.H. > R.F. | 2.9 | 99.8 |
| | R.H. > L.H. | 1.1 | 86 |
| C.F. — W.A.A. | > C.F. — Club | 2.0 | 98 |
| R.F. — Club | > R.F. — W.A.A. | 1.98 | 98 |

* $D$ = difference between averages. $\sigma \text{ diff} = \sqrt{\sigma^2_{Av_1} + \sigma^2_{Av_2}}$

See H. E. Garrett, *Statistics in Psychology and Education*. New York: Longmans, Green and Co., 1926.

## TOTAL DISTANCES TRAVELED IN GAMES

The figures for total distances add nothing to the discussion of relationships between positions and players but are of general interest. Each distance given below is an average of four thirty-minute halves of games played in the Pacific Coast Sectional Tournament.

| | *Center Forward* | *Right Halfback* | *Right Fullback* |
|---|---|---|---|
| Yards (Half Game) ..... | 2336.1 | 2756.3 | 2509.2 |
| Miles (Half Game) ..... | 1.33 | 1.57 | 1.43 |
| Miles-per-hour ..... | 2.66 | 3.14 | 2.86 |

It would seem that an average walker would cover as great a distance in an hour as does a hockey player in a game.

## AREAS COVERED BY PLAYERS

The part of the field which is covered by the various players may best be shown by composite records of play. In Figures 1 to 6, a series of consecutive three-minute records have been superimposed to give a picture of the path of an individual throughout an entire playing period. Figures 1 to 4 are of Club players and are from records taken during games in the Sectional Tournament. Figures 5 and 6 are of less experienced W.A.A. players and have been selected for comparative purposes. The erratic path with excursions across the field made by the W.A.A. center forward readily explains the greater distance covered by this player than by the Club center forward (Figures 1 and 5). Again, the purely defensive play of the W.A.A. fullback is in contrast to the play of the Club right fullback which extends to the opponents' twenty-five-yard line.

The total areas of the field used by players in the various positions are shown in Figures 7 to 9. These areas were outlined from composite game records of different individuals and enclose all of the field used by any player in a given position at any time throughout a number of playing periods. Thus, no center forward went outside the area indicated in Figure 7 on any occasion, regardless of position of ball or distribution of play. Figure 7 shows that the center forward travels the entire length of the playing field, and in the attacking half of the field covers approximately one-half the width of the field. In the striking circle at the goal she is attacking; the center forward covers approximately the middle two-thirds. The area used by the center forward in Figure 1 is considerably smaller than the total area for all center forwards shown in Figure 7, but shows the same widening out in the attacking half of the field, reaching its maximum at the twenty-five-yard line.

Figure 8 outlines the areas covered by right and left halfbacks. The right half covers approximately one-half of the total area of the field—more than is covered by center forward or left half. She plays from her own end line to the opponents' striking circle, and from the right side line to the middle of the field. Her territory narrows somewhat in the attacking half of the field and stops at the edge of the striking circle. Whether or not the ideal right half should play so far to the center of the field is open to question. In Figure 2 the right half plays quite definitely in the right third of the field.

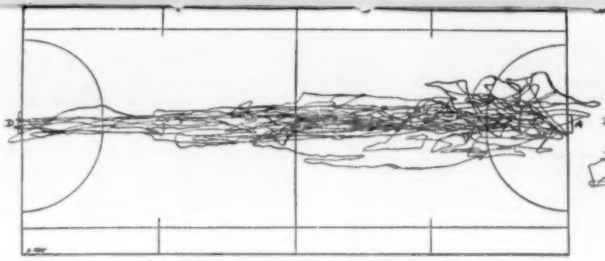

FIGURE 1.—Center Forward

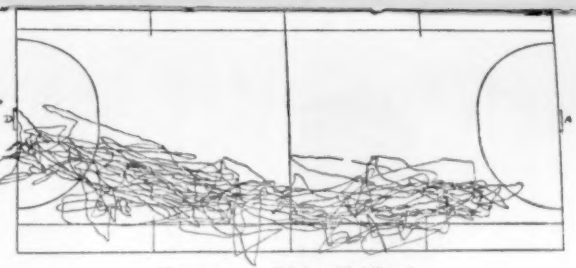

FIGURE 2.—Right Halfback

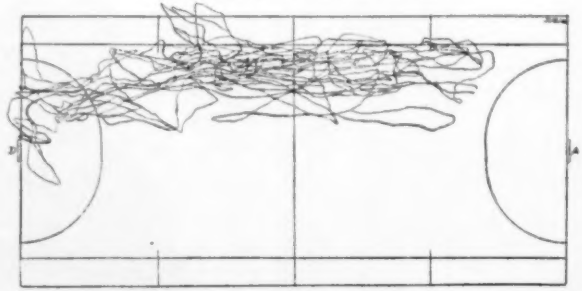

FIGURE 3.—Left Halfback

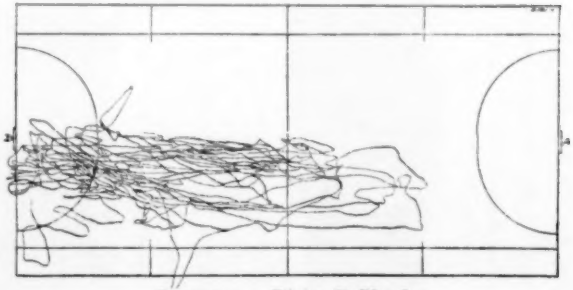

FIGURE 4.—Right Fullback

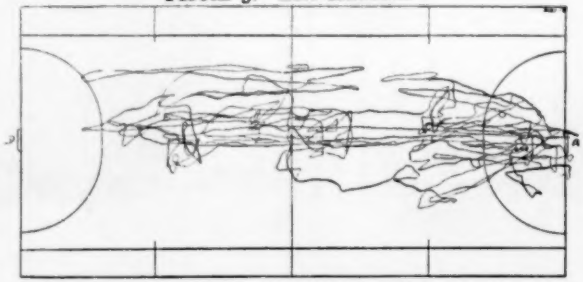

FIGURE 5.—Center Forward

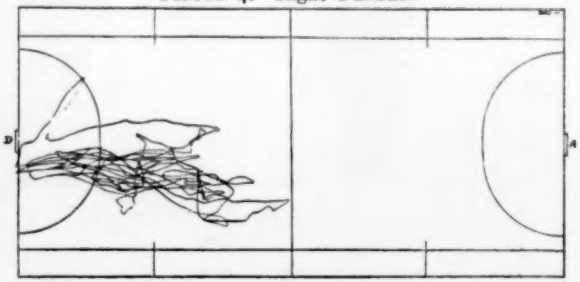

FIGURE 6.—Right Fullback

**FIGURES 1–6.—Paths of Players**
**Explanation: D = goal player is defending A = goal player is attacking**

FIGURES 7–9.—Areas covered by players

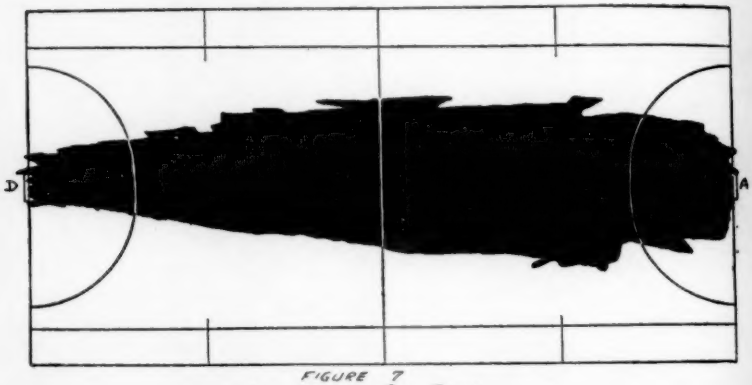


FIGURE 7
Area Covered by Center Forwards

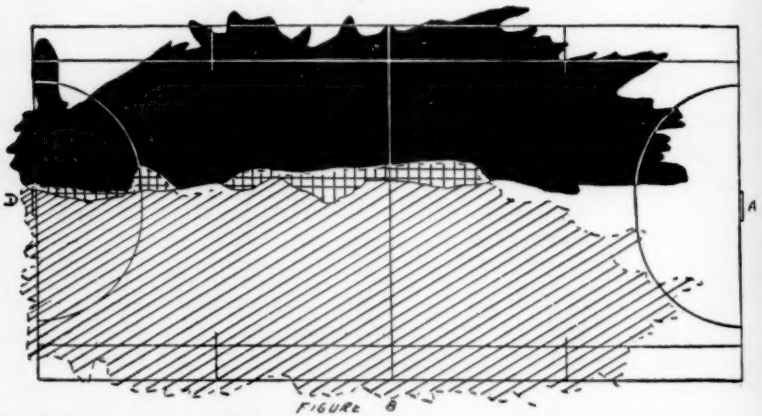


FIGURE 8
Area Covered by Left Half Backs
Area Covered by Right Half Backs
Area Covered by both Right and Left Half Backs

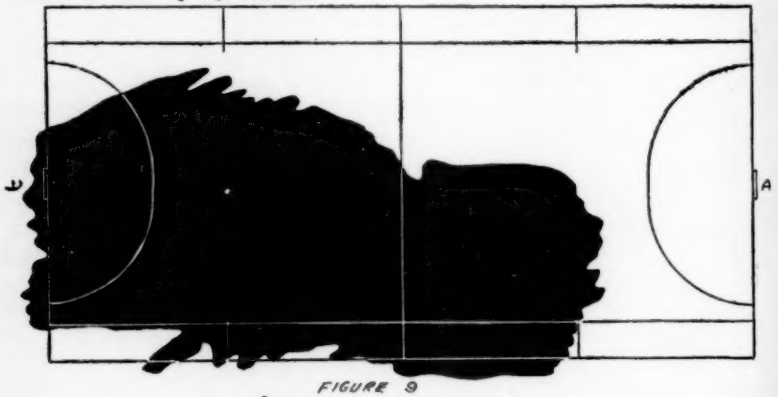


FIGURE 9
Area Covered by Right Full Backs

The left half does not play quite so far into the center of the field as does the right half. Apparently no left half studied had occasion to go into the alley and a small part of the field between the twenty-five-yard line and her own end line. Surely this territory must be covered defensively by the left halfback. It is possible that the ball was never carried into this part of the field during the play observed.

The right fullback (Figure 9) uses an area greater than that of any other player. This area extends from her own end line to the opposite twenty-five-yard line, and from the right sideline approximately two-thirds of the way across the field. In defense interchange, a fullback may be expected to cross to the opposite side of the field. It should be noted that this wide area all lies in her own half of the field and that the greatest width is between the twenty-five- and fifty-yard lines. In Figure 4 the right fullback rarely crossed the field or entered the alley.

The overlapping of these various areas is enormous, of course. The momentary position of any player within her total area depends upon the position of the ball, of her team mates, and of her opponents. It may be seen, however, that there are two small corners of the field and of the striking circle near the opponents' goal which are not entered by any player studied. These areas are undoubtedly covered by the inners and wings. How great may be the overlapping between total areas among forward-line players cannot be estimated from this study. Figure 8 shows that, on attack, the center halfback is needed to cover the territory between the side halves. In defense, however, the area of the center half must overlap that of each side half and of each fullback. Figures 8 and 9 show how great is the overlapping between side half and fullback. This overlapping of areas adds enormously to the complexity of the team play but is essential for adequate defense.

## RATE OF SPEED OF RUNNING

The ratio between the distance covered and the time in action is the rate of speed of movement. As mentioned above, the number of seconds of inactivity for each three-minute record was measured with the aid of a stop-watch. These figures are given in Table IV.

TABLE IV

NUMBER OF SECONDS PER THREE-MINUTE PERIOD

| | | C.F. | R.H. | L.H. | R.F. |
|---|---|---|---|---|---|
| Club: | Range .... | 0–99 | 0–70 | 0–80 | 0–100 |
| | Mean ..... | 27.8 | 29.2 | 26.7 | 39.0 |
| W.A.A.: | Range .... | 0–110 | 0–70 | 10–90 | 0–132 |
| | Mean ..... | 34.2 | 34.3 | 40.1 | 47.8 |

For all positions, the W.A.A. players are inactive slightly more than are Club players. The fullbacks are inactive for a longer time than are center forwards or halfbacks. The rate of movement in yards per minute (Table V) for Club players shows that the right half has the highest rate,

116.7 yards per minute. The center forward, left half, and right fullback all have approximately the same rate of 103 yards per minute. The W.A.A. center forward and right half move at an average rate of 112 yards per minute; the left half at 108 yards per minute; and the fullback drops to the very low rate of 87 yards per minute. The range in rate of movement is quite wide: from the lowest rate of 50 yards per minute for a center forward to a maximum speed of 158 yards per minute for a right halfback.

TABLE V

RATE OF SPEED OF MOVEMENT IN YARDS PER MINUTE

| | | C.F. | R.H. | L.H. | R.F. |
|---|---|---|---|---|---|
| Club: | Range ..... | 49.9–133.1 | 71.4–158.5 | 91.1–115.6 | 80.3–150.8 |
| | Mean ..... | 101.2 | 116.7 | 104.9 | 103.61 |
| W.A.A. | Range ..... | 53.2–145.8 | 73.4–130.3 | 91.4–133.3 | 56.4–117.1 |
| | Mean ..... | 112.4 | 112.4 | 107.7 | 87.0 |

## PLAYING THE BALL

An exact recording of the number of times a player hits the ball with her stick was not possible. In dribbling and in tackling where rapid successive or intermittent contacts may be made, the record may show only one contact. So the figures in Table VI must be regarded as rough approximations.

TABLE VI

AVERAGE NUMBER OF TIMES THE BALL IS PLAYED PER THREE-MINUTE PERIOD

| | C.F. | R.H. | L.H. | R.F. | L.F.* |
|---|---|---|---|---|---|
| Club | | | | | |
| In practice ..... | 3.5 | 3.8 | 3 | 3.2 | |
| In competition ... | 2.3 | 2.8 | * | 2.8 | |
| W.A.A. | | | | | |
| In practice ..... | 4.2 | 2.4 | 2.7 | 1.7 | |
| In competition ... | 3.8 | * | 4.3 | 2.0 | |

* Too few records.

In all cases, Club players hit the ball less often in games than in practice, averaging slightly above one contact per minute in practice and slightly below that in games. All positions studied play the ball a similar number of times. Among W.A.A. players, the fullbacks play the ball an appreciably less number of times. This is to be expected from the defensive type of play shown by the W.A.A. fullbacks.

## GAME RECORDS FROM THE PACIFIC COAST SECTIONAL TOURNAMENTS

Means and variability measures tell us much about the relative demands of the game of field hockey upon various positions. Continuous records of individual players throughout the game show how these players adjust to the demands. Figures 10 to 12 give for four different individuals the records of total distance traveled, of rate of movement in yards per minute, of the number of seconds rest, and of the number of times the ball was played.

Explanation:

——— Total distance traveled in yards
. . . . . Rate of speed in yards per minute
— — — — Time of inactivity in seconds
- - - - - - - - Number of contacts with the ball.

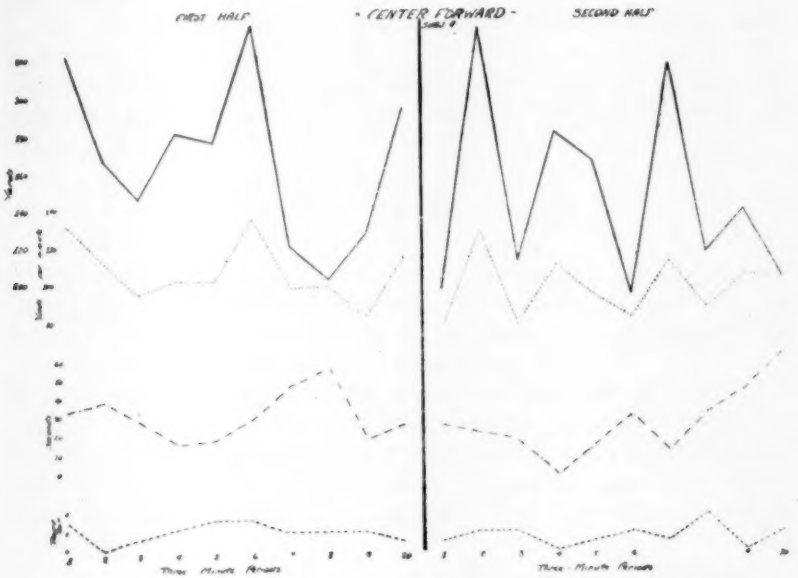


FIGURE 10

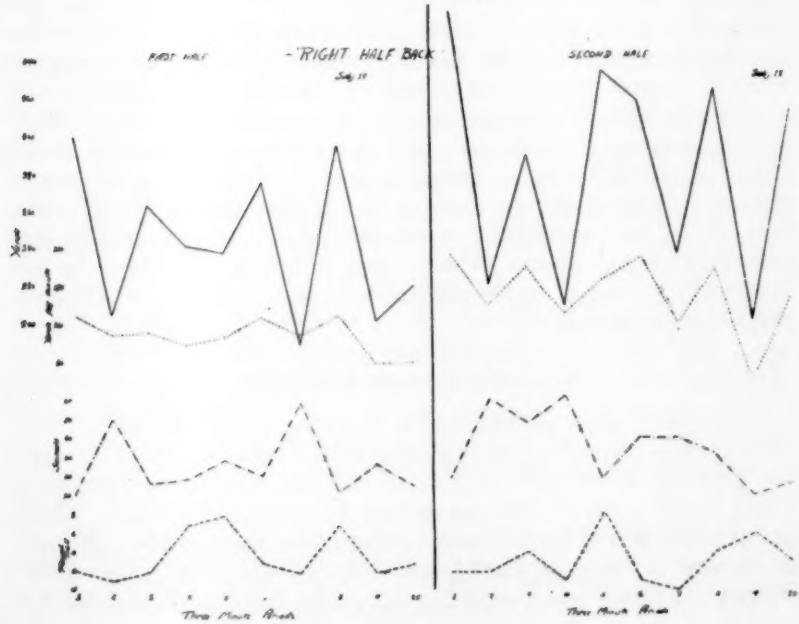


FIGURE 11

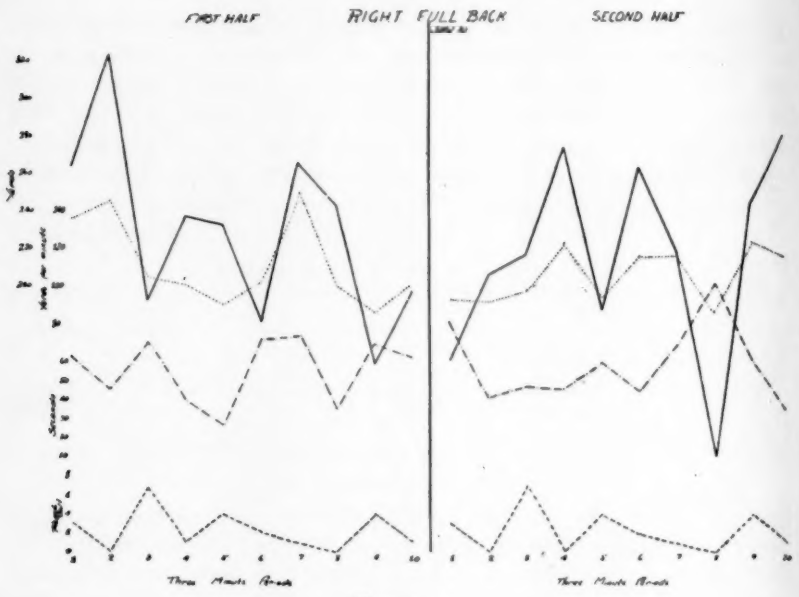


FIGURE 12

The most striking thing in all figures is the extreme fluctuation from one period to the next in total distance traveled. There is a similar fluctuation, usually opposite in direction, of the time at rest. That this relationship is not perfect is readily seen by the fluctuation of the ratio between these measures—the rate of movement. There is no correlation between distance covered and number of times the ball is played.

The amount of fluctuation in distance covered and in rate of speed is to some extent a function of the length of the period of observation. If this period had been of shorter duration, the changes would be less extreme but would still be present. The general pattern of the game, then, is one of alternation between periods of vigorous activity and periods of milder activity. Whether this pattern is determined by the nature of the game or by the physiological limitations of the individual player cannot be said.

## INDICATIONS OF FATIGUE

The official game of field hockey is played in two halves of thirty minutes each. No time-out is permitted except in case of injury to players. Records for ten Club players of fourteen complete thirty-minute halves (seven each of first and second halves) were available. These records were studied for indications of fatigue as measured by reduction in distance or in speed during the thirty-minute period. From these records, the means and standard deviation for distance covered and for

rate of speed of movement were calculated for (1) the entire thirty-minute period, (2) the first nine minutes of the period, and (3) the last nine minutes.

For total distance traveled, no reliable differences were found. This agrees with the result of the study of Messersmith and Corey¶ on distances traveled by men during a basketball game. In rate of speed of movement, however, some reduction may be noted. The figures are as follows:

| | *Mean* | *Sigma* |
|---|---|---|
| (1) 30-minute period | 102.5 yd. per min. | 12.0 |
| (2) First 9 minutes | 104.8 yd. per min. | 14.4 |
| (3) Last 9 minutes | 95.9 yd. per min. | 10.1 |

The difference between the means for the first nine minutes and for the last nine minutes is not completely reliable since it is only twice its standard error.** This reduction in rate is quite consistent, however, as twelve of the fourteen cases studied show it.

Nine records for short-half games were available, the playing period ranging from fifteen to twenty minutes. The first four minutes of this period were compared with the last four minutes. Even with the short playing period, a loss in rate of speed occurs in seven cases. When these figures are combined with the above, the results for twenty-three halves are as follows:

| | *Mean* | *Sigma* |
|---|---|---|
| (1) Half game | 103.8 yd. per min. | 20.3 |
| (2) First 4–9 minutes | 107.0 yd. per min. | 16.8 |
| (3) Last 4–9 minutes | 96.9 yd. per min. | 14.8 |

Here, the difference between the first and last parts of the playing period is almost completely reliable, being 2.7 times the standard error of the difference.‡

No significant difference in distance covered or in rate of movement can be shown between the first and second halves of the game. Apparently the ten-minute rest between halves enables the player to run as far and as fast during the second half as she is able to do during the first. The data are too meagre for adequate comparison.

## SUMMARY

1. The purpose of this study was to determine the distances traveled and the rate of speed of movement of field hockey players. The study was limited to five positions: center forward, right and left halfback, right and left fullback.

2. The technique of recording was perfected by two people. Agreement within 5 per cent for records made simultaneously was taken as the criterion of accuracy.

¶ L. L. Messersmith and S. M. Corey, "The Distance Traversed by a Basketball Player," RESEARCH QUARTERLY, II: 2 (May, 1931), 57–60.

** Chances of a true difference greater than zero = 98 in 100.

‡ Chances of a true difference greater than zero = 99.7 in 100.

3. Selection of players for study was made on the basis of position, degree of ability, amount of experience, and variety of coaching background.

4. The distance covered per three-minute period varies with position and with skill of players. Among defense players, the right half travels the greatest distance, followed in order by left half, left full, and right full. The "good" center forwards travel a shorter distance than do the "fair" and "poor" center forwards. The "good" right fullbacks travel a greater distance than do "fair" and "poor" fullbacks. The "good" center forwards and the "good" right fullbacks cover approximately equal distances.

5. The total distance traveled by center forwards in a 60-minute game is 2.7 miles; by right fullbacks, 2.9 miles; by right halfbacks, 3.1 miles.

6. Players in each position cover certain specific areas of the field. The territory of the right fullback is the largest, followed in order by right half, left half, and center forward. This study shows a great overlapping of area among defense players.

7. The rate of speed of running is greatest for the "good" right half and less but approximately equal for "good" left half, right fullback, and center forward. Among the "fair" players, right half and center forward average the highest, followed by left half and finally by right fullback.

8. Each player hits the ball on an average of once per minute. With "good" players, all positions play the ball an approximately equal number of times.

9. During the playing period there is a continual fluctuation in distance traveled and in periods of inactivity. These measures are negatively correlated. There is no correlation between playing the ball and distance covered.

10. Fatigue, as indicated by a reduction in rate of speed of movement from the beginning to the end of the playing period, can be demonstrated in a majority of cases but not with complete reliability. No differences between first and second halves were found in the data available.

11. Among "good" players, the most strenuous position in terms of distance covered, time in action, and rate of movement is that of right halfback. There are no reliable differences among the other positions studied, although results would indicate that all defense positions tend to be slightly more strenuous than the position of center forward.

# The Energy Cost of Chinning the Bar and Push-up Exercises

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THIS investigation was carried on to determine the energy requirements of two of the more familiar individual exercises. Data of this nature, when obtained for a large number of athletic activities, will enable directors and teachers of physical education to plan their activity programs with a better understanding of the relative severity or mildness of the exercises in which their students engage. Moreover, such data will have a similar value to physicians in planning exercises for their patients during convalescence. Even the industrialist is interested in knowing the energy demands of the many types of work which his employees do.

In this report, we are presenting the averages for the laboratory determinations on the energy cost of these exercises. For the "push-up," both men and women students served as subjects for the experiments, whereas only men were used in chinning the bar.

The "push-up" is a fairly strenuous exercise involving both flexor and extensor muscles of the body. Many of these muscles are used in maintaining the "proper" form in which this exercise is executed, while others are concerned with the elevation of the body from the horizontal, prone position, at the start, to its inclined position at the finish in which the arms are fully extended.

Chinning the bar is a strenuous exercise, requiring vigorous action on the part of the depressor muscles of the upper arm and of the flexors of the forearm. It has been our experience that most students choose the "under-hand" rather than the "over-hand" grasp when performing this exercise. The "under-hand" grasp appears to be selected because the "over-hand" position seems the more fatiguing, although, as we have found, not the more costly in energy, as one might be tempted to assume.

The energy determinations for the "push-up" exercise were made for a group of twenty-five men and thirty-eight women students. Similar measurements were made for thirty-five men in the case of "chinning the bar." Most of them were students majoring in physical education, and were doing these experiments as a regular part of the

laboratory work of their course in physiology of exercise, which they take in their junior or senior year at college. These features, we feel, contribute to the reliability of the results obtained.

## METHOD OF PROCEDURE

All the experiments of these investigations were made with the subjects in the post-absorptive state, and therefore free from the influence of diet on metabolism. The tests were run at sometime in the forenoon for each subject, who, in the case of chinning the bar, did five chinnings in approximately eleven seconds, or in the "push-up" exercise, did ten push-ups in twenty seconds, the rate in each case being set by a metronome. In the starting position for chinning the bar, each subject stood erect with his upper extremities stretching straight up to the bar. From this position he elevated himself to a height where his chin was brought just above the level of the bar, from which he dropped back to the starting position before repeating the movement. A small step-ladder was used directly beneath the bar for subjects who were not tall enough to reach it conveniently when standing on the floor. The push-up exercise was done from the prone position of the body, with supports for both the hands and the feet to prevent slipping during its performance.

The Collins' chain-compensated gasometers of the Tissot type were used for the collection of the expired air in all these experiments. The respiratory exchange was measured for the "basal" and "resting" positions, and for the period of "exercise and recovery." The "basal" position was the standard reclining position in which basal metabolism is taken. The "resting" position for the push-up exercise was also a reclining position, but one in which the body lay in a prone instead of the supine position of the basal. The "resting" position for chinning the bar was the normal standing position with the arms hanging at the sides. The respiratory exchange for the "basal" and "resting" positions was measured for a period of ten minutes for each of the exercises studied. It was found that "recovery" for the push-up exercise required less than ten minutes, for which reason the respiratory exchange for the period of "exercise and recovery" was run ten minutes. But, in the case of chinning the bar, the "recovery" necessitated nearly twenty minutes. The respiratory exchange, for chinning the bar, was therefore run for a period of twenty minutes. In many cases, for both exercises, a check on recovery was run so as to establish the validity of our estimate of the time required for recovery.

Haldane gas analyzers were used to determine the percentage of carbon dioxide and oxygen present in the samples of expired air taken from the gasometers. From the sum of these percentages the volume per cent of oxygen that the subject actually used can be computed. By dividing, mathematically, the volumes per cent of $CO_2$ by the volumes per cent of $O_2$, the respiratory quotient, or R. Q., is obtained. The R. Q. in turn indicates the number of Calories that were evolved

for each litre of oxygen consumed. All volumes of expired air were reduced to standard conditions of temperature and pressure (0° Centigrade and 760 mm. Hg) in accordance with Boyle's and Charles' Laws.

## RESULTS

In the case of chinning the bar, all three of the conditions, viz., the "basal," "resting (standing)," and "exercise and recovery" were computed on the basis of a twenty-minute period in order to simplify calculations and interpretation, although the basal and resting periods were run for only a ten-minute period each.

The calculations represented in Tables I to V are the averages for the groups of men and women studied for the physiological conditions indicated.

The "excess" Calorie column of Table V has been subdivided into "gross" and "net" columns, the former representing the extent to which the "exercise-recovery" cost exceeds the Calories required for the "basal" period, and the "net" referring to the similar difference between the "exercise-recovery" cost and the Calories required for the "resting" period. The "net" column represents what is customarily designated as the energy cost of an exercise. The "gross" column is of interest mainly as an index of the cost of an exercise over and above the normal basal metabolism.

TABLE I

| No. of Subjects | Sex | Kind of Exercise | Av. Body Wt. in Kg. | Av. Ht. in cm. | Av. S. A. | Pulmonary Ventilation | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Basal | Resting | Ex. and Rec. |
| 35 | Men | Chinning Bar | 71.6 | 177.8 | 1.87 | 5.510 | 7.375 | 9.326 |
| 25 | Men | Push-up | 69.2 | 173.5 | 1.81 | 5.218 | 6.447 | 9.673 |
| 38 | Women | Push-up | 57.2 | 164.3 | 1.58 | 4.353 | 4.698 | 7.010 |

S. A. represents the surface area of the body in square meters.
The pulmonary ventilation was measured in litres per minute.

TABLE II

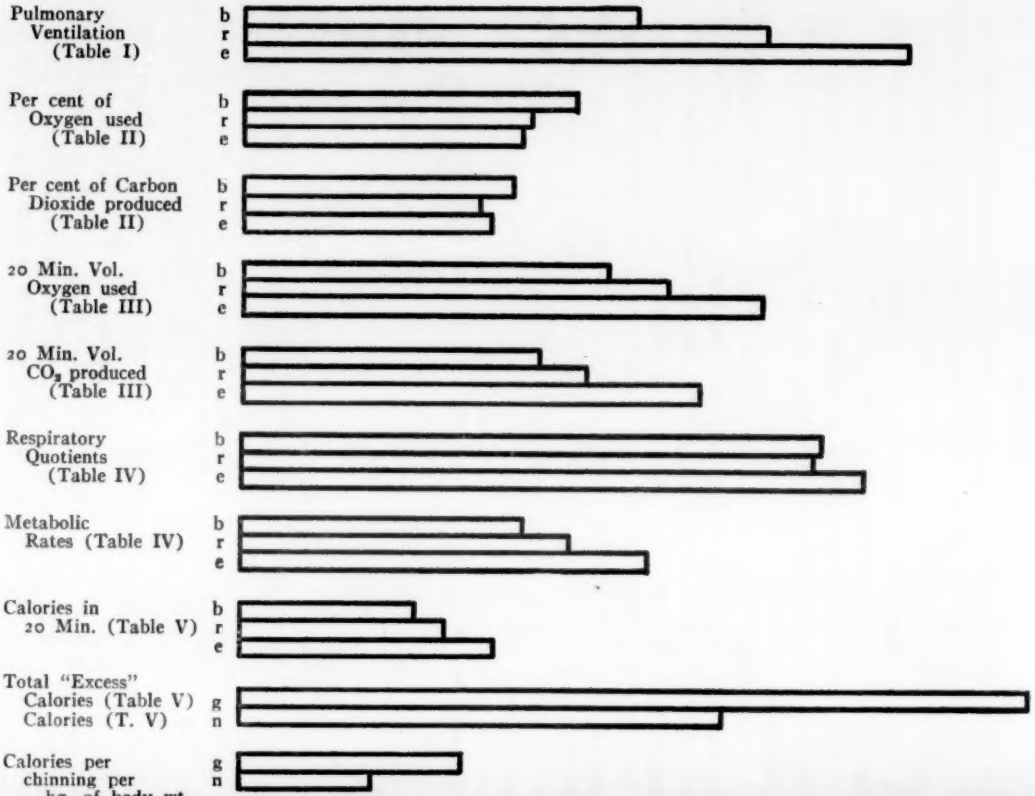
| Per cent of Oxygen Used | | | Per cent of Carbon Dioxide Produced | | |
|---|---|---|---|---|---|
| Basal | Resting | Ex. and Rec. | Basal | Resting | Ex. and Rec. |
| 4.677 | 4.159 | 3.960 | 3.809 | 3.338 | 3.470 |
| 4.734 | 4.534 | 4.216 | 3.996 | 3.996 | 4.135 |
| 4.504 | 4.587 | 4.434 | 3.590 | 3.760 | 4.038 |

The data in this and the succeeding tables are arranged in the same order for the men and women and the exercises as they appear in Table I.

TABLE III

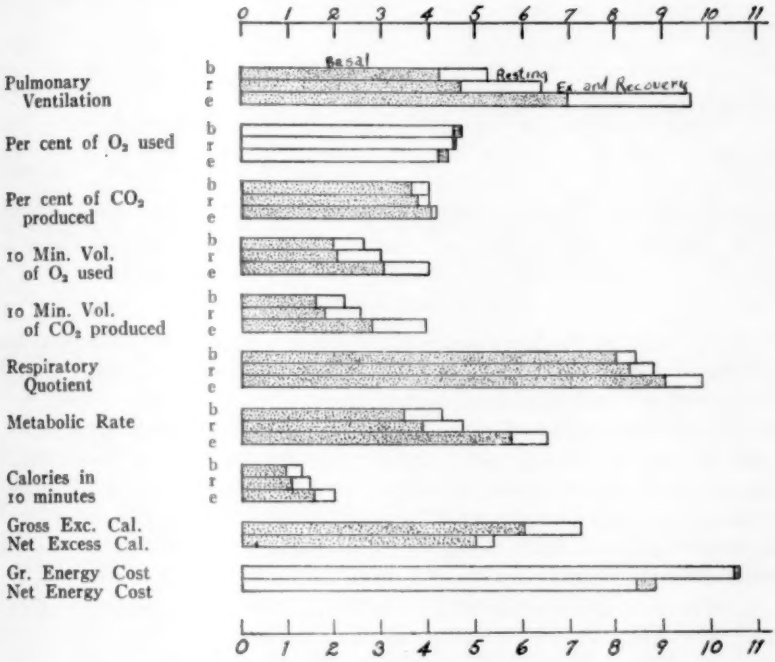
| 20 Minute Vol. of $O_2$ Used (litres) | | | 20 Minute Vol. of $CO_2$ Produced (litres) | | |
|---|---|---|---|---|---|
| Basal | Resting | Ex. and Rec. | Basal | Resting | Ex. and Rec. |
| 5.120 | 6.020 | 7.316 | 4.186 | 4.845 | 6.415 |
| 5.256 | 5.786 | 7.958 | 4.374 | 5.146 | 7.932 |
| 3.864 | 4.254 | 6.190 | 3.096 | 3.522 | 5.614 |

## Graphic Representation of Chinning the Bar Data




**Explanation of the Graph: The length of each bar is based on arbitrary units representing the comparative magnitude of the data. The *b, r, e* at the left of each bar refer to the "basal," "resting," and "exercise-recovery" data of their respective tables; the *g* and the *n* to "gross" and "net" values respectively.**

GRAPHIC REPRESENTATION OF ENERGY COST DATA—THE PUSH-UP FOR MEN AND WOMEN




Explanation of the Graph: The stippled portion of each bar represents the women's data for the conditions at its left. This stippled portion has been super-imposed on the plain bar which represents the men's data for the same conditions. The end of the stippled and plain bars represents the average for the women's and men's data as designated. The *b*, *r*, *e*, at the left of the bars refer to the "basal," "resting," and "exercise-recovery" data of the tables. The numbers on the scale are arbitrary units for representing the comparative magnitude of the data.

TABLE IV

| Respiratory Quotients | | | Metabolic Rates | | |
|---|---|---|---|---|---|
| Basal | Resting | Ex. and Rec. | Basal | Resting | Ex. and Rec. |
| 0.8164 | 0.8046 | 0.8776 | 39.577 | 46.308 | 57.257 |
| 0.8425 | 0.8783 | 0.9876 | 42.364 | 47.017 | 66.208 |
| 0.8003 | 0.8265 | 0.9099 | 34.685 | 38.607 | 57.539 |

The metabolic rates are expressed in terms of Cal. per hr. per sq. meter of body surface.

TABLE V

| Calories Evolved in 20 minutes (For Chinning the Bar) | | | "Excess" Calories | | Energy Cost/Ex./Kg. | |
|---|---|---|---|---|---|---|
| Basal | Resting | Ex. and Rec. | "Gross" | "Net" | "Gross" | "Net" |
| 24.720 | 29.031 | 35.813 | 11.088 | 6.732 | 0.0308 | 0.0190 |
| Calories Evolved in 10 Minutes (For the Push-up) | | | | | | |
| 12.753 | 14.330 | 19.963 | 7.244 | 5.380 | 0.0105 | 0.0084 |
| 9.263 | 10.292 | 15.305 | 6.042 | 5.012 | 0.0106 | 0.0088 |

In order to standardize the energy cost for subjects of different body weight, it was necessary to express this cost in Calories per chinning or push-up per kilogram of body weight. Thus, the average "net" cost of each chinning per kilogram weight of the men performing this exercise was 0.0190 Calorie.

## DISCUSSION OF RESULTS

Inspection of the bar graphs will show at a glance the relative magnitude of the results for the three conditions measured, viz., the "basal," the "resting," and the "exercise-recovery."

It will also be noted from the bar graph for the push-up exercise, that the values for the men exceed those for the women in all cases except for the percentage of oxygen used and in the energy cost per push-up per unit of body weight. Whether this difference is truly fundamental we are unable to say. It might disappear if many more cases were studied.

There was greater variability in energy cost for the subjects chinning the bar than for the push-up, but, in each exercise, the higher cost coincided with the difficulty that the subject encountered in performing it.

## CONCLUSIONS

Women appear to require more energy to do the push-up exercise than men. This greater energy cost per unit of body weight may be the result of a difference in body mechanics due to more poorly developed shoulder and arm muscles.

The energy cost of chinning the bar was found to be more than twice as great as that for the push-up among the men students studied.

Exercise offers no panacea for reducing body weight since these rather strenuous activities require so little energy.

# A Preliminary Study of Standards of Performance in Athletic Skills of Junior High School Boys

By GREYSON DAUGHTREY

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## INTRODUCTION

THIS presentation is a preliminary study in the attempt to establish standards of performance for boys of junior high school age.* It seems that a study of this kind based on intensive teaching of correct kinesiological procedures is in order. Numerous records and statistical data have been compiled with no particular emphasis placed on the teaching process beforehand. This study is made of records taken from tests given after three years of intensive kinesiological teaching. It is hoped that these tests will set an example of what may be accomplished by the correct and intensive application of kinesiology. With these standards as a goal, the result should eventually raise the level of achievement in the elementary and senior high school.

## A BRIEF SURVEY OF THE FIELD

Some tests have been given in various activities but the standards have been so low that the results have not meant very much. It is doubtful if any school knows just what the level of achievement is for its pupils.

Interscholastic competitors, Olympic prospects, aspirants of breaking world records—all have marks and standards of achievement which are continually broken. However, these are of a certain limited number. Our aim in physical education is to reach as many pupils as possible. We should endeavor to have all pupils improve and set new standards of achievement.

Many books have been written which describe the methods of tests and measurements, but the literature in physical education is sadly lacking in material on actual standards of achievement. Bovard and Cozens state: "We do not as yet have objective evidence in regard to the efficiency of various methods of instruction." [1]

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* Presented in the Research Section of the Southern District Convention of the American Physical Education Association at Knoxville, Tennessee, March 9–11, 1936.

[1] J. F. Bovard and F. W. Cozens, *Tests and Measurements in Physical Education.* (Philadelphia: W. B. Saunders Co., 1930), p. 24.

Williams shows "there were no tests in physical education available for the survey that were comparable to those used in academic subjects." [2]

Bovard and Cozens[3] list a group of tests which are used in various parts of the United States. However, they state "the great need of an adjustment of standards so that the entire country may be able to use one set understandingly." [4] These groups of tests may be criticised very severely. One criticism is the lack of some fair classification of pupils for the tests. Ages and grades, due to wide variations, are the poorest of all plans of classification. Another criticism is the lack of proper activities to be tested. Activities should not be tested on their simplicity, but on their worth. Certain skills should have precedence over others, because of their worth-while value.

Still another criticism would be the apparent lack of intensive teaching procedures before giving the tests.

## BLAIR JUNIOR HIGH SCHOOL

Blair Junior High School is an average school plant with about six hundred fifty boys enrolled in physical education. The physical education department consists of two instructors, one for the girls and one for the boys. The facilities are mediocre, having two very good gymnasia as the only assets. The equipment is very limited. With the exception of a few balls, the entire program is financed by dues paid for membership in the various intramural activities. Around seventy-five or eighty dollars a year is raised by these dues to finance the department.

The program at Blair is divided into three main heads, namely, the required class work, intramurals, and special work for physical deviates.

The program of required class work is controlled by the director with the aid of the student instructors and squad leaders. The routine and procedure involved in selecting squad leaders and student instructors are too technical to be discussed here. It will suffice to say that the squad leaders are the left-hand men of the director and are elected by the pupils. The student instructors are the right-hand men and are appointed by the director after they have passed a strict examination. The instructors are taught the theory and given the practice in advanced phases of physical education. Each instructor has a class which he commands, according to the plans set down by the director.

The aim of the program in required class work is to place before all pupils those advantages of physical education which are essential to pupils and which carry over into after-school life, enabling the individual to be better equipped to meet the problems and emergencies of life. Briefly, the first part of the program consists of health procedures,

[2] J. F. Williams, *Principles of Physical Education.* (Philadelphia: W. B. Saunders Co., 1927), p. 443.

[3] J. F. Bovard and F. W. Cozens, *op. cit.*, pp. 289–298.

[4] *Ibid.*, p. 289.

## ORGANIZATION PLAN OF THE PHYSICAL EDUCATION DEPARTMENT OF BLAIR JUNIOR HIGH SCHOOL

INSTRUCTOR

STUDENT INSTRUCTOR ORGANIZATION

### REQUIRED CLASS WORK

FALL PROGRAM

I. Health program
  A. Studies in physiology, health habits, and sex
  B. Measurements and weight of all pupils
II. Physical program
  A. Proper calisthenics and preliminary exercises
  B. Marching
  C. Fundamentals of sports
    a. Football
      1. Passing, punting, centering, receiving
    b. Tennis
      1. Serving, driving, footwork, returning
    c. Soccer
      1. Heading, trapping, dribbling
    d. Tumbling
      1. Ten stunts

WINTER PROGRAM

I. Health program
  A. Same as Fall
II. Physical program
  A. Same as Fall
  B. Same as Fall
  C. Fundamentals of sports
    a. Basketball
      1. Passes, shooting, dribbling, pivoting
    b. Mass fundamentals
      1. Boxing, resuscitation

SPRING PROGRAM

I. Health program
  A. Same as Fall
II. Physical program
  A. Same as Fall
  B. Same as Fall
  C. Fundamentals of sports
    a. Track
      1. Dashes, high jump, broad jump, discus, shot, javelin, hurdles, relays
    b. Baseball
      1. Base circling, batting, fielding, pitching
    c. Golf
      1. Putting, stances, practice with other clubs

### INTRAMURAL ORGANIZATION

STUDENT INTRAMURAL MANAGER

MANAGERS

ACTIVITIES WITH NUMBER OF PARTICIPANTS FOR 1935

| | |
|---|---|
| Soccer | Bowling |
| 1000 | 50 |
| Basketball | Tumbling |
| 200 | 17 |
| Track | Horse Shoes |
| 500 | 42 |
| Baseball | Football Pass |
| 125 | 10 |
| Golf | Badminton |
| 15 | 17 |
| Tennis | Bicycling |
| 43 | 25 |
| Boxing | Skating |
| 35 | 5 |
| Football | Squad |
| Punt | Leaders |
| 10 | 150 |
| Fencing | Student |
| 40 | Instructors |
| Swimming | 125 |
| 56 | Indoor |
| Hand Ball | Olympic |
| 40 | Meet |
| Ping-Pong | 250 |
| 70 | Total |
| | 2825 |

### SPECIAL WORK FOR PHYSICAL DEVIATES

Special work for those boys who being physically handicapped are unable to gain the desired results from required class work. The program is divided into three groups:

A. Corrective
  Special exercises for those with postural deviations

B. Recreational
  Special activities for those with organic defects

C. Instructional
  Health program similar to that listed under the required work

which include bodily measurements, studies in health and physiology, and the development of those organs which are underdeveloped. The second part of the required program consists of the teaching and practice of the fundamentals of correct sport skills, essentials of first aid, and actual practice in leadership.

The intramural organization at Blair consists of twenty-one different clubs and activities controlled by the student intramural staff with the director as its head. The participation in intramurals is very great—2,825 boys participated in 21 different activities during the year 1935. The intramural department has two primary aims: (1) give all pupils an opportunity to find some activity suited to their physical equipment by placing as many activities as possible before them; and (2) give all individuals an opportunity for instruction and participation in the activities they like and are physically fitted for.

The special program for deviates consists of a special class for pupils who are unable physically to gain the proper benefits from the required program. These pupils, however, take the required program also to the

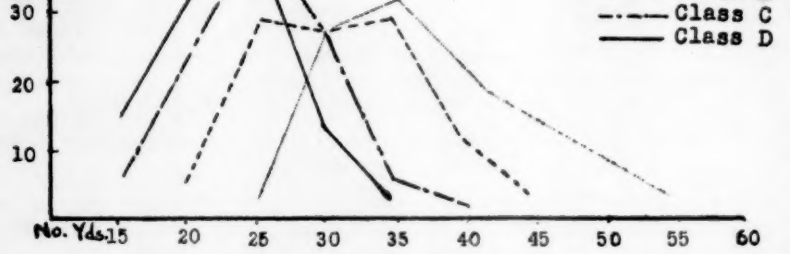


FIGURE 1.—Performance of pupils in classes *A*, *B*, *C*, and *D* in football pass at Blair Junior High School. (Data from Table I.)

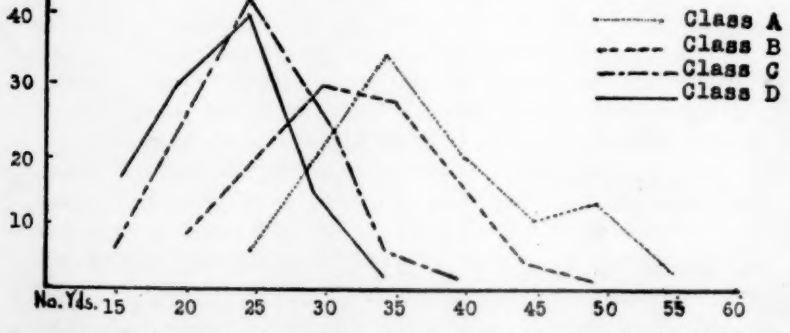


FIGURE 2.—Performance of pupils in classes *A*, *B*, *C*, and *D* in football punt. (Data from Table I.)

TABLE I

RECORDS OF NUMBER AND PER CENT OF PUPILS AT BLAIR JUNIOR HIGH SCHOOL PARTICIPATING IN FOOTBALL PASS, PUNT AND PLACE-KICK, BY CLASSES A, B, C AND D

| No. of Yds. | Class A | | | | | | Class B | | | | | | Class C | | | | | | Class D | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Pass | | Punt | | Place Kick | | Pass | | Punt | | Place Kick | | Pass | | Punt | | Place Kick | | Pass | | Punt | | Place Kick | |
| | No. of Pupils | Percentage | No. of Pupils | Percentage | No. of Pupils | Percentage | No. of Pupils | Percentage | No. of Pupils | Percentage | No. of Pupils | Percentage | No. of Pupils | Percentage | No. of Pupils | Percentage | No. of Pupils | Percentage | No. of Pupils | Percentage | No. of Pupils | Percentage | No. of Pupils | Percentage |
| 13–17 | | | | | | | | | | | 1 | .5 | 8 | 5.0 | 2 | 1.1 | 4 | 2.5 | 14 | 14.1 | 8 | 7.3 | 9 | 8.9 |
| 18–22 | | | | | 1 | 1.4 | 11 | 5.3 | 14 | 6.4 | 26 | 12.1 | 34 | 21.3 | 30 | 17.0 | 36 | 22.9 | 31 | 31.3 | 37 | 34.0 | 47 | 46.5 |
| 23–27 | 1 | 1.3 | 4 | 5.1 | 1 | 1.4 | 58 | 28.1 | 40 | 18.2 | 47 | 21.9 | 67 | 41.9 | 74 | 42.0 | 53 | 33.8 | 40 | 40.4 | 46 | 42.2 | 28 | 27.7 |
| 28–32 | 19 | 25.3 | 14 | 17.9 | 19 | 27.2 | 55 | 26.6 | 64 | 29.1 | 54 | 25.1 | 41 | 25.6 | 47 | 26.7 | 42 | 26.7 | 13 | 13.1 | 14 | 12.9 | 11 | 10.9 |
| 33–37 | 23 | 30.6 | 26 | 33.3 | 24 | 34.4 | 58 | 28.1 | 61 | 27.7 | 50 | 23.3 | 8 | 5.0 | 18 | 10.2 | 17 | 10.8 | 1 | 1.0 | 4 | 3.7 | 6 | 5.9 |
| 38–42 | 15 | 20.0 | 15 | 19.2 | 15 | 21.5 | 21 | 10.2 | 33 | 15.0 | 27 | 12.6 | 2 | 1.3 | 5 | 2.8 | 5 | 3.2 | | | | | | |
| 43–47 | 10 | 13.3 | 8 | 10.3 | 7 | 10.0 | 4 | 1.9 | 6 | 2.7 | 7 | 3.3 | | | | | | | | | | | | |
| 48–52 | 6 | 8.0 | 9 | 11.5 | 3 | 4.3 | | | 1 | .5 | 1 | .5 | | | | | | | | | | | | |
| 53–57 | 1 | 1.3 | 1 | 1.3 | | | | | | | | | | | | | | | | | | | | |
| 58–62 | | | 1 | 1.3 | | | | | | | | | | | | | | | | | | | | |
| Totals | 75 | | 78 | | 70 | | 207 | | 219 | | 213 | | 160 | | 176 | | 157 | | 99 | | 109 | | 91 | |
| Range | 25–56 | | 24–60 | | 21–49 | | 18–45 | | 19–48 | | 17–50 | | 15–38 | | 16–40 | | 15–42 | | 13–33 | | 13–36 | | 15–37 | |
| Mean | 37.68 | | 37.77 | | 35.86 | | 30.80 | | 31.95 | | 30.59 | | 25.45 | | 26.63 | | 26.38 | | 22.51 | | 23.38 | | 23.47 | |
| Median | 37 | | 36 | | 35 | | 30 | | 32 | | 30 | | 26 | | 26 | | 25 | | 23 | | 23 | | 23 | |
| Mode | 35 | | 35 | | 35–40 | | 35 | | 30–35 | | 25–35 | | 26–30 | | 23–30 | | 25–30 | | 20–25 | | 25 | | 20–25 | |

best of their ability. They have to compete with normal individuals in actual life and the junior high school is the place to become adjusted to this situation.

These three phases of physical education should be emphasized in all schools and no physical education program is complete without them.

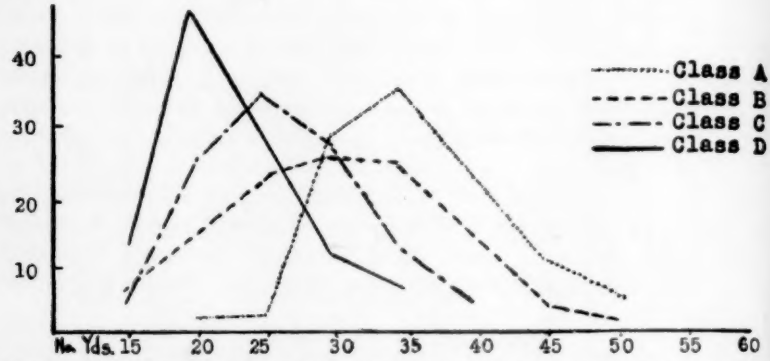


FIGURE 3. Performance of pupils in classes *A*, *B*, *C*, and *D* in football place-kick. (Data from Table I.)

## STATISTICAL PROCEDURE OF THE STUDY IN STANDARDS OF ACHIEVEMENT FOR BOYS IN THE JUNIOR HIGH SCHOOLS

This study when completed will include all the measurable activities listed on the individual record card, shown on the opposite page. The other activities are important to be practiced, but the element of choice enters too much to have any statistical importance. The measurable activities which will be included in the complete study are: football punt, football pass, place kick, goals per minute R.H., goals per minute L.H., broad jump, baseball throw, base circling, high jump, hurdles, shot put, and the dashes.

The individual record shown on the next page is the record card given to each pupil at the beginning of the term, and is so arranged that it covers an entire semester. This card is a composite incorporation of required skills, classification of pupils, measurements of pupils, and the arrangement of each skill in proper interval for each class with the records and points in each class.

Originating in the Boys' Physical Education Department at Blair, the chart has been recently adopted for use by the boys' and girls' departments in other schools of the Norfolk system. The activities listed are those skills which every boy is required to practice and take tests on. An effort has been made to select skills which have bearing on the important phases of physical education. As can be seen, the skills selected include the important physical activities that should be stressed.

The lower section of the card is used in determining the class of in-

dividuals. As can be readily seen, an adaptation of Reilly's plan is used. In operation, the procedure is to find the exponents for the age, height, and weight of the pupil, obtain the sum of the exponents, then determine the class by looking at the column labeled classes. Due to the wide variation, the grades have been left out in classifying.

Too little emphasis is placed on classification of pupils in schools throughout the United States. A recent report was made on this phase

BLAIR JUNIOR HIGH SCHOOL

INDIVIDUAL RECORD CARD

NAME Jones GROUP E7B6 YEAR 1935 LEADER White CLASS A

| | JUDGE'S SCORE | SCALE FOR POINTS | | | | | | | | | | | | | | | | ACTUAL RECORD | POINTS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | CLASS D | | | | | CLASS C | | | | | CLASS B | | | | | CLASS A | | |
| FIRST SIX WEEKS | | 4 | 8 | 12 | 16 | 20 | 4 | 8 | 12 | 16 | 20 | 4 | 8 | 12 | 16 | 20 | 4 | 8 | 12 | 16 | 20 | | |
| Foot Ball Punt - Distance | 60 | 10 | 13 | 15 | 18 | 20 | 20 | 23 | 25 | 28 | 30 | 30 | 33 | 35 | 38 | 40 | 40 | 43 | 45 | 48 | 50 | 50 | 30 |
| Foot Ball Pass - Distance | 50 | 10 | 13 | 15 | 18 | 20 | 20 | 23 | 25 | 28 | 30 | 30 | 33 | 35 | 38 | 40 | 40 | 43 | 45 | 48 | 50 | 50 | 30 |
| Tennis Serve - Out of Ten | 10 | 1 | 2 | 3 | 4 | 5 | 2 | 3 | 4 | 5 | 6 | 4 | 5 | 6 | 7 | 8 | 6 | 7 | 8 | 9 | 10 | 10 | 30 |
| Soccer Kick - Out of Ten | 10 | 1 | 2 | 3 | 4 | 5 | 2 | 3 | 4 | 5 | 6 | 4 | 5 | 6 | 7 | 8 | 6 | 7 | 8 | 9 | 10 | 10 | 30 |
| Tumbling - Out of Ten | 10 | 1 | 2 | 3 | 4 | 5 | 2 | 3 | 4 | 5 | 6 | 4 | 5 | 6 | 7 | 8 | 6 | 7 | 8 | 9 | 10 | 10 | 30 |
| SECOND SIX WEEKS | | | | | | | | | | | | | | | | | | | | | | TOTAL | 100 |
| Foot Ball Punt - Distance | 60 | 10 | 13 | 15 | 18 | 20 | 20 | 23 | 25 | 28 | 30 | 30 | 33 | 35 | 38 | 40 | 40 | 43 | 45 | 48 | 50 | 60 | 30 |
| Foot Ball Pass - Distance | 50 | 10 | 13 | 15 | 18 | 20 | 20 | 23 | 25 | 28 | 30 | 30 | 33 | 35 | 38 | 40 | 40 | 43 | 45 | 48 | 50 | 50 | 30 |
| Place Kick - Distance | 50 | 10 | 13 | 15 | 18 | 20 | 20 | 23 | 25 | 28 | 30 | 30 | 33 | 35 | 38 | 40 | 40 | 43 | 45 | 48 | 50 | 50 | 30 |
| Foot Ball Pass-Out of Ten | 10 | 1 | 2 | 3 | 4 | 5 | 2 | 3 | 4 | 5 | 6 | 4 | 5 | 6 | 7 | 8 | 6 | 7 | 8 | 9 | 10 | 10 | 30 |
| Tumbling -Out of Ten | 10 | 1 | 2 | 3 | 4 | 5 | 2 | 3 | 4 | 5 | 6 | 4 | 5 | 6 | 7 | 8 | 6 | 7 | 8 | 9 | 10 | 10 | 30 |
| THIRD SIX WEEKS | | | | | | | | | | | | | | | | | | | | | | TOTAL | 100 |
| Goals Per Minute - Right Hand | 40 | 1 | 3 | 5 | 8 | 10 | 12 | 15 | 18 | 20 | 22 | 24 | 26 | 28 | 30 | 32 | 32 | 34 | 36 | 38 | 40 | 50 | 30 |
| Goals Per Minute - Left Hand | 30 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 10 | 13 | 15 | 18 | 20 | 20 | 23 | 25 | 28 | 30 | 30 | 20 |
| Spot Shot -Out of Ten | 10 | 1 | 2 | 3 | 4 | 5 | 2 | 3 | 4 | 5 | 6 | 4 | 5 | 6 | 7 | 8 | 6 | 7 | 8 | 9 | 10 | 10 | 20 |
| Dribble & Shoot-Out of Ten | 10 | 1 | 2 | 3 | 4 | 5 | 2 | 3 | 4 | 5 | 6 | 4 | 5 | 6 | 7 | 8 | 6 | 7 | 8 | 9 | 10 | 10 | 20 |
| Military -Out of Ten | 10 | 1 | 2 | 3 | 4 | 5 | 2 | 3 | 4 | 5 | 6 | 4 | 5 | 6 | 7 | 8 | 6 | 7 | 8 | 9 | 10 | 10 | 20 |
| | | | | | | | | | | | | | | | | | | | | | | TOTAL | 100 |

| AGE | HEIGHT | WEIGHT | EXPONENT | CLASSES | MEASUREMENTS | |
|---|---|---|---|---|---|---|
| 12-0-5 | 57-58 | 81-85 | 7 | CLASS D | | |
| 12-6-11 | 59 | 86-89 | 8 | Sum of exponents is 26 and under | AGE | 14 |
| 13-0-5 | 60-61 | 90-93 | 9 | | HEIGHT | 5'11¼ |
| 13-6-11 | 62 | 94-96 | 10 | CLASS C | | |
| 14-0-5 | 63 | 97-99 | 11 | Sum of exponents is 27 to 35 | WEIGHT | 131 |
| 14-6-11 | 64 | 100-102 | 12 | | NECK | 14 |
| 15-0-5 | 65 | 103-105 | 13 | | | |
| 15-6-11 | 66 | 106-108 | 14 | | CHEST | 33 |
| 16-0-5 | 67 | 109-111 | 15 | CLASS B | | |
| 16-6-11 | 68 | 112-114 | 16 | Sum of exponents is 36 to 46 | ARM | 10 |
| 17-0-5 | 69 | 115-119 | 17 | | | |
| | 70 & over | 120-124 | 18 | | WAIST | 29 |
| | | 125-129 | 19 | CLASS A | | |
| | | 130-134 | 20 | Sum of exponents is 47 and over | THIGH | 20 |
| | | 135-139 | 21 | | | |
| | | 140-141 | 22 | | CALF | 13 |
| | | 142-143 | 23 | | | |
| | | 144-145 | 24 | | | |

at the James Monroe High School of Seattle, Washington. This report shows that the simple and obsolete forms of classification predominate. Sound methods, such as Reilly's, are listed at the bottom. The report does not show whether the cause is lack of knowledge or lack of desire to use the best method. These methods entail considerable work, but in the long run are more satisfactory.

The upper part of the chart is used in taking tests, and in determining records and points made in the four classes. It is seen that all classes have the skills arranged progressively, according to standards of performance. The standards for each class are set rather high. These standards were set up as validly as possible, since there are no existing

standards of this type. The new charts will be made using the averages in this study as a basis for setting standards for each class. This method of giving tests stimulates interest because the pupils not only know what they are supposed to achieve, but also see the number of points which may be accumulated.

From the results of these tests, the football pass, football punt, and place-kick have been selected for statistical study at this time. On all the tests, measurements were made from line to line. That is to say, all measurements were made from where the ball was kicked or thrown to the exact spot it touched, rolling not included in the measurement. The field was spaced in five-yard intervals with markers on either side. Regulation footballs were used, with each boy having three trials at each event, selecting the best trial to be recorded as the individual score.

## CONCLUSION

1. The records shown in the study are sufficiently high to be offered as standards of performance for junior high school boys.

2. The records prove that the intensive application of kinesiology will affect the achievements of large groups of pupils.

3. These records may be used for standards of performance, since they are based on a valid and reliable classification plan.

4. The averages of each group may be used in planning a point system for each of the four classes, and establishing standards for the classes.

# Weight Deviation and Health in a College Group

By Ross L. Allen, Dr. P.H.,
*Assistant Editor, Journal of Health and Physical Education*
and the Research Quarterly

THE need for a reliable and practical method of "screening out" college students whose anthropometric measurements deviate radically from the average of the bodily measurements of the majority of students of comparable age and development is urgent.* Extreme deviations in individual measurements may be indications of pathological or structural deficiencies which require thorough medical observation and therapeutics. The relation between height and weight has long been used as a "screen" for the detection of "underweight," "overweight," or "malnourished" cases. The value of this relationship has been questioned by investigators who have produced convincing evidence that there are other combinations of bodily traits which correlate more highly with physicians' estimates of nutritional status than that of height and weight.

A study of combinations of anthropometric traits which do have greater relationship with status of health as judged by competent physicians should facilitate the formulation of a new screening method which would be more valid and practical in its application to the examination of large groups of individuals. Such a screening device would in no sense replace the medical examination. It would merely select students who might profit by further and more thorough attention of medical experts. A predictive index and formula for "screening out" these students has been developed, and will be explained in Part I of this study.

Knowledge of the relationship of bodily, skeletal, or constitutional types to certain medical data, such as morbidity, frequency and length of periods of illness, occurrence of specific physical defects, etc., would facilitate the prediction and expectance of these factors for various types of individuals. It is hoped that this study will throw some light on this relationship. The public, at least, has considered that deviation from weight standards is indicative of poor health, especially malnutrition. Medical and other scientifically trained persons in health work have qualified this consideration. It can be said that most physicians today will look upon a case of extreme overweight or underweight as

* Abstract of a dissertation submitted in partial fulfillment of the requirement for the degree of Doctor of Public Health, University of Michigan, 1936.

suspicious of malfunction, or pathology. The wide-spread belief that underweight and overweight individuals do have "something wrong" with them is a major consideration in Part II of this dissertation. Specifically, if a person is fifteen per cent or more underweight, or twenty per cent or more overweight, do his medical examination and health records for a year show any cause or effect relationship? Is an underweight individual prone to certain diseases, and does he possess a preponderance of certain types of defects? Do overweight individuals have defects, illnesses, etc., which are peculiar to them? These questions will be answered to some degree in this study by comparing the health records of male members of the entire freshman class of 1938 of the University of Michigan with those records of men within the class who deviate excessively from certain standards for weight.

## REVIEW OF LITERATURE

There is not space in this abstract to include an adequate survey of the literature in the field of anthropometric measurements in relation to the determination of weight and health status. It must suffice to

SUMMARY OF VARIOUS CORRELATIONS OF ANTHROPOMETRIC MEASUREMENTS FOUND IN THE LITERATURE WHICH ARE COMPARABLE TO THE CORRELATIONS OF MEASUREMENTS IN THE PRESENT STUDY

| Bibliography Numbers | Source | Age Group (Males) | Number of Cases | *$r_{12}$ Ht-Wt | $r_{12}$ Ht-CGE | $r_{12}$ Wt-CGE | $r_{12.3}$ Ht-Wt-CGE | $r_{12.3}$ Ht-CGE-WT | $r_{12.3}$ WT-CGE-Ht |
|---|---|---|---|---|---|---|---|---|---|
| No. 18 | Selective Service Men | 21–30 | 860,000 | .4810 | .2304 | .6907 | .4574 | .1606 | .6797 |
| No. 2 | Schuster | 18 | 129 | .500 | | | | | |
| No. 2 | Baldwin | 17 | 60 | .680 | .556 | .872 | | | |
| No. 2 | Mumford Young | 18 | 25 | .784 | .373 | .780 | | | |
| No. 2 | U.S. Public H.S. | 15–19 | 322 | .711 | .562 | .846 | | | |
| No. 2 | Univ. of Minnesota | 18 | 407 | .484 | .255 | .726 | | | |
| No. 2 | U.S. Army Officers | 20–24 | 483 | .520 | .243 | .681 | | | |
| No. 2 | C.M.T.C. | 18 | 28,727 | .524 | .295 | .711 | | | |
| No. 18 | Love | 21–24 | 2,360 | .554 | .331 | .751 | | | |
| No. 7 | C. C. N. Y. | 18 | 669 | .523 | | | | | |
| No. 7 | U. of Calif. | 18 | 508 | .508 | | | | | |
| No. 7 | U. of Cinc. | 18 | 718 | .476 | | | | | |
| No. 7 | Cornell U. | 18 | 833 | .557 | | | | | |
| No. 7 | U. of Minn. | 18 | 903 | .499 | | | | | |
| No. 7 | Princeton U. | 18 | 874 | .500 | | | | | |
| No. 7 | Stanford U. | 18 | 689 | .525 | | | | | |
| No. 7 | U. of Texas | 18 | 724 | .437 | | | | | |
| No. 7 | U. of Wis. | 18 | 591 | .499 | | | | | |
| No. 7 | Yale Univ. | 18 | 659 | .493 | | | | | |

Ht = Height; Wt = Weight; CGE = Chest Girth Expanded; $r_{12}$ = zero order correlation; $r_{12.3}$ = first order partial correlation.

refer to a few investigators.* Franzen,[10] Diehl,[7] Schmidt,[20] Quimby,[15] and Boillin[3] have been recent contributors to the knowledge of techniques for weight prediction. Excellent studies of the relation of constitutional types to disease have been made by Pearl and Ciocco,[23] Draper,[8] Gould, [18] Love,[18] Love and Reed,[19] and Dublin.[9]

A review of the literature shows an agreement between the authors in that there is a definite relationship between body build and certain types of diseases. It is rather surprising to find the agreement which is quite obvious in their assignment of certain diseases to distinct constitutional or skeletal types.

## PART I

### Study of the Interrelationship of Certain Anthropometric Measurements and the Development of a Predictive Formula for Weight for Eighteen Year Old College Men

The following anthropometric measurements were taken of the men entering the University of Michigan in the fall of 1934: height, weight, chest girth expanded and contracted, biceps contracted and extended, chest depth (normal inspiration; normal expiration) and hip width. Further references to them will be made using the following abbreviations: Height—Ht; Weight—Wt; Chest Girth Expanded—CGE; Chest Girth Contracted—CGC; Biceps Contracted—BiC; Biceps Extended—BiE; Chest Depth, Normal Inspiration—CDI; Chest Depth, Normal Expiration—CDE; and Hip Width—Hips. These measurements were taken using the usual anthropometric technique. Exact description of the latter may be found in the original dissertation.

In order to make the interpretation and calculations of the data

Zero Order Correlations—Nine Anthropometric Traits

| | Hip Width | Chest Depth Expired | Chest Depth Inspired | Biceps Expanded | Biceps Contracted | Chest Girth Contracted | Chest Girth Expanded | Weight |
|---|---|---|---|---|---|---|---|---|
| Height | .4869 | .1968 | .1856 | .0487 | .0908 | .1731 | .2299 | .5212 |
| Weight | .7450 | .6423 | .5915 | .7535 | .7603 | .7609 | .7776 | |
| Chest Girth Expanded | .5059 | .5455 | .5456 | .7147 | .7135 | .8975 | | |
| Chest Girth Contracted | .5161 | .5138 | .5535 | .7009 | .7087 | | | |
| Biceps Contracted | .4887 | .5182 | .5114 | .8859 | | | | |
| Biceps Extended | .4504 | .5754 | .5240 | | | | | |
| Chest Depth Inspired | .4576 | .8431 | | | | | | |
| Chest Depth Expired | .4499 | | | | | | | |

* Indices after author's names refer to the Bibliography at the end of this article.

manageable by one person, 459 cases from the eighteen year old group, with the nine measurements completed, were chosen for this study. The number of cases for the sixteen, seventeen, nineteen, and twenty year old age groups was too small to make any significant conclusions from their interpretation, and made impossible the development of a valid and reliable predictive formula for weight for any of the age groups except the eighteen year olds.

Zero order correlations were first determined for each of the above anthropometric traits with each of the others (table preceding page).

First order partial correlations of weight with the various other measurements were then made.

FIRST ORDER PARTIAL CORRELATIONS OF WEIGHT WITH EACH OF THE REMAINING TRAITS

| | | | | | |
|---|---|---|---|---|---|
| Wt–Ht. | CGE | .5596 | Wt–CDE. | Ht | .6450 |
| | CGC | .6095 | | CGC | .4509 |
| | BiC | .6990 | | CGE | .4139 |
| | BiE | .7379 | | BiC | .4469 |
| | CDI | .5192 | | BiE | .4912 |
| | CDE | .5253 | | CDI | .3152 |
| | Hips | .2717 | | Hips | .5155 |
| Wt–CGE. | Ht | .7921 | Wt–Hips. | Ht | .6996 |
| | CGC | .3309 | | CGC | .6348 |
| | BiC | .5165 | | CGE | .6492 |
| | BiE | .5200 | | BiC | .6597 |
| | CDI | .6732 | | BiE | .6919 |
| | CDE | .6650 | | CDI | .6622 |
| | Hips | .6966 | | CDE | .6668 |
| Wt–CGC. | Ht | .7980 | Wt–BiE. | Ht | .8389 |
| | CGE | .2878 | | CGC | .4830 |
| | BiC | .4846 | | CGE | .4664 |
| | BiE | .4965 | | BiE | .3043 |
| | CDI | .6456 | | CDI | .6607 |
| | CDE | .6546 | | CDE | .6521 |
| | Hips | .6588 | | Hips | .6810 |
| Wt–BiE. | Ht | .8542 | Wt–CDI. | Ht | .5900 |
| | CGC | .4757 | | CGC | .3151 |
| | CGE | .4495 | | CGE | .3173 |
| | BiC | .2655 | | BiC | .3631 |
| | CDI | .6460 | | BiE | .3518 |
| | CDE | .6646 | | CDE | .0561 |
| | Hips | .7019 | | Hips | .4225 |

## THE PREDICTIVE EQUATION FOR WEIGHT OF EIGHTEEN YEAR OLD COLLEGE MEN

From an analysis of the zero and first order correlations, the best combination of anthropometric traits which can be used to predict weight for this group would be chest girth, girth of biceps, and the width of hips. Since the girth of chest expanded and the girth of the

biceps contracted seem to have greater influence on the determination of weight than girth of chest contracted and girth of biceps extended, the use of CGE, BiC, and Hips should give us our best predictive equation. The regression equation for predicting weight from these three measures is suggested by Holzinger[16] (p. 302).

$$\bar{X}_1 = r_{12\cdot34}\frac{\sigma_{1\cdot34}}{\sigma_{2\cdot34}}X_2 + r_{13\cdot24}\cdot\frac{\sigma_{1\cdot24}}{\sigma_{3\cdot24}}X_3 + r_{14\cdot23}X_4 + C$$

Substituting the calculations from our data, we finally have

$$\bar{X}_1 = 1.2032\ \text{CGE} + 1.168\ (\text{BiC}) + 2.6535\ \text{Hip Width} + (-19.006)$$

The Predicted Value of Wt in pounds = 1.203 (CGE in inches) + 1.168 (BiC in inches) + 2.6535 (Hip Width in centimeters) + (—19.006).

## DETERMINATION OF WEIGHT BY USE OF THE PREDICTIVE FORMULA

(Sample Case)

Eighteen Year Old College Male:

Chest Girth Expanded, in inches = 34.7
Biceps Girth Contracted, in inches = 29.2
Hip Width, in centimeters = 30.6

Applying the predictive formula we have

Predicted Weight = $1.203 \times 34.7 + 1.168 \times 29.2 + 2.654 \times 30.6 + (-19.006)$
Predicted Weight = $41.744 + 34.106 + 81.212 - 19.006$
Predicted Weight = 138.056 pounds.

## SELECTION OF UNDERWEIGHT AND OVERWEIGHT CASES BY THE USE OF THE PREDICTIVE FORMULA AND BY THE STANDARD TABLE

In the 459 cases of the eighteen year old men considered in this particular section of the report, 23 men were underweight at least 15 per cent in relation to their "standard" * weight, while 5 were 15 per cent of more underweight in relation to their weight as predicted with the devised formula. This would indicate that when a combination of chest girth expanded, biceps girth contracted, and hip width is used for prediction, 23 cases of the total of 28 cases of underweight men in the entire group would *not* be considered underweight. In the total group, 28 cases are at least 15 per cent underweight using the two standards for prediction, i.e., height alone, and the combination of the three anthropometric measurements. Two cases were selected as underweight by the battery of measurements in the predictive formula which were not 15 per cent or more underweight according to the standard

* Standard Table of Weight for Men as determined by the studies of insurance companies. See reference No. 7.

tables; 16 cases were at least 15 per cent underweight using the standard scale who were not underweight to this extent when the predictive equation was employed as the criterion.

In other words, 57 per cent of the cases judged in this study to be 15 per cent or more underweight by the "standard" table, (using height alone to predict weight) were not underweight to this extent (usually considerably less) when the factors of hip width, biceps girth, and chest girth are combined and used for prediction of weight. Such a percentage of inaccuracy should be sufficient evidence to justify the use of time necessary to make the three measures for prediction by the devised formula.

In the 459 eighteen-year-old men in this college group, 18 were overweight at least 20 per cent in relation to their "standard" weight, while 5 men were overweight 20 per cent or more when the predictive formula was used. On the latter scale, 15 men would not be 20 per cent or more overweight who would be considered as such on the "standard" table. Three cases were considered 20 per cent or more overweight using the predictive formula who were not classified as such when using the standard scale.

It is quite apparent that a battery of anthropometric traits for prediction of weight is more highly selective than a single variable, such as height. Fewer individuals are considered underweight or overweight when the predictive formula is employed, because constitutional or skeletal type is taken more into account by the use of more anthropometric measurements.

If it can be shown that the use of the predictive formula selects individuals needing more medical attention, and having more defects, than the weight-height tables select, the wider use of the predictive index should be recommended.

## PART II

### An Analysis of Findings from the Medical Histories and Dispensary Cards of Those Male Students Deviating 20 Per Cent or More Above or 15 Per Cent or More Below the Standard and Predictive Weight Norms in the Class of 1938, University of Michigan, during 1934–1935

This section of the study will attempt to demonstrate the relation of abnormal and normal findings of health in men to excessive deviation from the standard weight norms* and the predictive weights for eighteen year olds as determined by the predictive formula devised in Part I.

The findings of a study of the histories taken during the entrance examination, the medical data, and the ratings of physical educators as

* *Tables of Standard Weight.* "Based on the records of . . . 221,819 Men accepted by American and Canadian Life Insurance Companies." From *Healthful Living* by Harold S. Diehl, M.D. (New York: McGraw-Hill Book Co., 1935), p. 322.

reported on the entrance examination records were analyzed. A resume of the various types of illness, causes for dispensary and room calls, reasons for infirmary and hospital admittances during 1934–1935, and the prevalence of these items was made.

Specifically, we are trying to discover if these weight deviation groups have a greater frequency of specific types of abnormalities than do those whose weights are considered "normal."

PERSONS STUDIED IN PART II OF THE PRESENT STUDY—MALES OF THE CLASS OF 1938, UNIVERSITY OF MICHIGAN

| Age Group | Number Studied | Number of Men Deviating Excessively From Standard or Predicted Weight | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Standard Weight | | | | | | Predicted Weight | | | | | |
| | | 20% or More Over | | 15% or More Under | | Total | | 20% or More Over | | 15% or More Under | | Total | |
| | | No. | % | No. | % | No. | % | No. | % | No. | % | No. | % |
| 17 | 196 | 13 | 6.6 | 12 | 6.1 | 25 | 12.7 | (Predictive Index not determined —insufficient no. of cases) | | | | | |
| 18 | 459 | 18 | 3.9 | 23 | 5.0 | 41 | 8.9 | 5 | 1.1 | 5 | 1.1 | 10 | 2.2 |
| 19 | 221 | 12 | 5.4 | 14 | 6.3 | 26 | 11.7 | (Predictive Index not determined —insufficient no. of cases) | | | | | |
| Total | 876 | 43 | 4.9 | 49 | 5.5 | 92 | 10.5 | 5 | .57 | 5 | .57 | 10 | 1.1 |

The predictive formula indicated five men deviating from the "normal" who did not deviate from the "normal" in respect to the Standard Table. In other words, when variables other than the single one of height in relation to weight were used, only ten cases were considered to be excessively under- or overweight. The predictive formula takes into consideration the skeletal build or type of the individual by considering chest circumference, biceps girth, and hip width. The standard tables are lacking in this regard as they use only one anthropometric variable to predict weight, that is, height. With the use of the Standard Tables, 10.5 per cent of the 876 cases deviate from the arbitrary standards (15 per cent or more underweight; 20 per cent or more overweight) which have been chosen. With the use of the predictive weight formula for the eighteen year olds, 2.2 per cent are selected as under- or overweight, while with the use of the Standard Tables 8.9 per cent are chosen. If the predictive formula is valid, then we have a more selective screen than the usual height-weight tables for determining deviation from weight.

Not all of the items on the history blank were considered in this study. Those factors included were presumed to have some relation to

over- or underweight; others were chosen for study merely from the standpoint of personal interest.

Family health, parents' build, the student's past and present health, his habits, his opinion of his own health, his nutrition, the health ratings given by medical examiners, dispensary and room calls made during the school year 1934–35, hospital and infirmary days during the above period, and diagnosis of disease were all studied. The items on the following table were the only ones found to possess significant differences in occurrence in the weight deviation group when compared with the entire freshman class of men.

ITEMS ON HEALTH RECORDS SHOWING SIGNIFICANT DIFFERENCES

| Item | Standard Weight Deviation Group (N—92) | | Entire Class (N—1167) | | Actual Difference between the Two Observed Percentages | Standard Error of Proportion | Standard Units |
|---|---|---|---|---|---|---|---|
| | No. | % | No. | % | | | |
| General Health Appearance (Medical) Rating | | | | | | | |
| Good | 73 | 79.0 | 1034 | 88.0 | 9.0 | .03 | 3.0 |
| Nutrition (Medical) Rating | | | | | | | |
| Good | 37 | 40.0 | 954 | 81.0 | 41.0 | .06 | 6.8 |
| Health (Medical) Rating | | | | | | | |
| "B" | 65 | 70.0 | 615 | 53.0 | 27.0 | .06 | 4.5 |

## PART III

### GENERAL CONCLUSIONS AND RECOMMENDATIONS

1. From the review of the literature on the use of anthropometric measurements in the prediction of weight, one finds that height alone is no longer considered a valid index of weight. Although many investigators have reported higher correlations between weight and chest girth expanded than between height and weight, none of them has recommended this combination of anthropometric measurements to replace the height-weight index.

Most investigators in studying the relation between constitutional types and incidence or proneness to specific illnesses are surprisingly in agreement as to a definite relationship between certain bodily types and specific illnesses. However, there is still much to be done in verifying these relationships.

2. The following formula for predicting weight in eighteen year old college males has been devised in this study:

Predicted Weight = 1.203 × Chest Girth Expanded (in inches) + 1.168 × Biceps Girth Contracted (in inches) + 2.654 × Hip Width (in centimeters) — 19.006.

Predicted weight from this formula has a much higher correlation with actual weight than does height alone. The significance of this predictive weight in relation to the health or nutritional status of the individual remains to be determined in some future study. Due to the lack of cases in age groups other than the eighteen year olds, a predictive formula for the latter group alone could be determined. When the predicted weight for each of the 459 eighteen year old freshmen was determined, only 5 students deviated 20 per cent or more above their predicted weight, and only 5 students deviated 15 per cent or more below their predicted weight. These 10 cases are obviously inadequate to determine the significance of this predictive index in relation to health status. Nevertheless, the writer believes that it may have significance in this respect since the only death occurring in males of the class of 1938 during the year 1934–1935 was among these ten boys. Further, the only boy in the class of 1938 who had to leave school on account of illness during 1934–35 was also one of this group deviating widely from his predicted weight. Another member of this group did not return for the school year, 1935–36. These specific cases may all be coincidences. Nevertheless, they indicate (to the writer, at least) that a future study involving a statistically adequate number of cases deviating from their predicted weight would be justified, and might even prove that this index has considerable significance in relation to health status.

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# Eighth Annual Report of the Committee on Curriculum Research*

By Professor Wm. Ralph LaPorte, *Chairman,*
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THE major objective of the curriculum research committee during its past eight years of service has been to formulate a comprehensive curriculum of physical education activities, so graded as to eliminate unnecessary duplication from year to year and so balanced as to be adaptable to any ordinary community situation.[1] Such a program should make it possible gradually to establish uniformity in the subject matter offered in various parts of the country, at least by school levels, thus minimizing the problems involved in the transfer of students from school to school. It should also dignify physical education by providing definite curriculum content, comparable to that in academic fields, as opposed to the traditional practice of merely giving the child exercise regardless of the medium involved.

The formulation of such a curriculum has required several very definite steps or procedures. Curriculum material must be adapted to child needs and these vary from year to year. One of the first steps taken by the committee, accordingly, was to catalogue all representative activities under appropriate major division headings and to evaluate them in terms of their contribution to child development on five bases: first, their physical contribution; second, their intellectual contribution; third, their social contribution; fourth, their safety contribution; and fifth, their recreational or carry-over contribution.

The second step involved allocating each activity in elementary and advanced form to the two school levels where natural interest in the activity would seem to be greatest and where the child would learn most easily and most thoroughly the essential fundamentals involved.

The third step was concerned with determining the relative amount of time that could justifiably be assigned to each activity as an integral part of the total program for the particular school level to which it had been allotted. This involved evaluations for the program for both boys and girls.

The fourth step included several survey studies of the interests of

*Presented before the College Physical Education Association, December, 1935. A continuation of previous reports published in May, 1930; March, 1931; May, 1932; March, 1933; May, 1934; and May, 1935, issues of the Research Quarterly.

[1] See Proceedings of the College Physical Education Association, 1929 to 1934 inclusive.

school children at the several levels to serve as validating factors for the various evaluations.

The fifth step has to do with the selection or determination of essential elements or performance techniques in the elementary and advanced levels for each of the activities included in the study. This fifth step will be described in this report under Subcommittee II, as the work just completed during the past year.

In addition to the steps outlined above, there are four other major responsibilities for the committee to fulfill, in addition to the determination of content elements of the curriculum. These include first, the selection of appropriate and measurable objectives; second, the experimental selection of suitable teaching techniques adapted to activity instruction; third, the establishing of standardized tests for measuring the results of teaching in the activity field; and fourth, the formulation of adequate administrative standards for carrying out the program as formulated.

In order to accomplish all of these objectives, the main committee during the past two years has been divided into five subcommittees for the purpose of expanding and facilitating the work. These correspond to the five main divisions outlined above.

It is obvious that each of these fields presents a most challenging problem and necessitates very extensive research in order to establish worth-while and defensible conclusions. Definite reports of progress were made last year for each subcommittee and a brief report for each subdivision is included herewith indicating the progress made during the past year.

# Part I

## Report of Subcommittee I
## Determination of Aims and Objectives

By Professor Frank S. Oktavec
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### I

In an attempt to establish acceptable objectives of physical education, this subcommittee collected the objectives listed in fourteen most recently published books on physical education, twelve state courses of study, eight municipal courses of study, two curricula reports of national professional committees, and those listed in four professional journals over the past twelve years. The objectives and their frequency of occurrence are listed in the appended Table I.

It was hoped that such a compilation might aid in clarifying the ambiguous and contradictory objectives of physical education generally proposed. Instead of clarifying the situation this compilation only in-

creased the subcommittee's bewilderment. In the hope of bringing some order out of this chaos, this subcommittee undertook two lines of inquiry, the results of which are presented.

## II

The first study attempts to establish some scheme of classification which might be adopted and used universally. The justification of this scheme of classification, as of any scheme of classification, lies in the fact that to classify and group, there is need for clarifying and for obtaining the exact meaning of the terms to be classified. Ambiguous terms will have to be either defined or discarded.

In last year's report, this subcommittee suggested that the classification of the objectives of physical education be grouped under three major headings. In this year's report we recommend the addition of a fourth major heading and we offer a number of subdivisions for each of these four major headings. This refined classification is as follows:

I. Objectives that center mainly around the *physical* or *somatic* aspects of the individual. These are subdivided into objectives dealing, in the main, with:
   - A. Single physiological functions such as lung capacity, blood pressure, etc.
   - B. Structure and size, such as size of organs, optimal weight, etc.
   - C. Health
     1. Health status, such as nutrition
     2. Health habits, such as adequate hours of sleep
   - D. Neuro-muscular
     1. Flexibility
     2. Strength
     3. Balance
     4. Reaction time
     5. Judgment of time, distance, weight

II. Objectives that center mainly around *intellectual* aspects or functions of the individual. These are to be subdivided into objectives dealing, in the main, with:
   - A. Those seeing relationships, making inferences, ability to analyze
   - B. Those of understanding and using abstract concepts
   - C. Those of using the scientific approach to the solution of everyday problems, of basing decisions on proven and verifiable facts; of knowing and recognizing rules of straight and logical thinking; of recognizing fallacious and loose reasoning; of having a questioning attitude
   - D. Those of acquiring knowledge and facts

III. Objectives that center mainly around the *emotional* aspects or functions of the individual and are largely expressed and deter-

mined by our feelings. These are to be subdivided into objectives dealing, in the main, with:

A. Those dealing with behaviors (actions and feelings) that exist only because of the existence of other individuals. These objectives must have the meaning of: "to be so-and-so *towards others,*" even though the words "towards others" may not be expressed, such as to act courteously, to cooperate in a joint venture, to be tolerant.

B. Those dealing with feelings enjoyed as ends in themselves such as, to feel joy in sheer rhythmic movement, to feel a thrill in hearing Beethoven's Fifth Symphony or seeing a sunset, to have the play spirit, etc.

IV. Objectives that are not clearly somatic, intellectual, or emotional aspects of the individual. These can be subdivided into objectives having in them elements of:

A. Initiative, self-direction, self-sufficiency.

B. Perseverance, stick-to-itiveness, sustained attention, self-control.

C. Self-assurance.

This classification is by no means final. It is proposed as the first step towards the establishment of an adequate and standard scheme of classification of the objectives of physical education.

## III

The second study attempts to establish criteria for the selection of the objectives of physical education. This is the first and necessary procedure in the establishment of any objectives. Setting up objectives means selection, and selection presupposes the use of some standard. And that is what criteria are—standards for judging.

To insure clear thinking, the definition of an "objective," as given in last year's report, is repeated. An "objective" is a stated asset which a student is to be aided in securing, and for the securing of which the teacher holds himself responsible.

The first criterion which an objective of physical education must satisfy is that it "be attainable." By attainable we mean that its achievement or possession is possible. An objective is to be considered attainable only when the possibility of its acquisition or achievement has been proven factually and scientifically. Unless so proven, an objective should not be included in any listings of the objectives of physical education.

Illustrations of attainable objectives of physical education are: "to increase muscle size," "to increase lung capacity," "to increase voluntary acceptance and the carrying out of duties assigned by a leader of one's own selection." The attainability of these objectives has been

proved. They fulfill our first criterion and may legitimately be used as objectives of physical education.

Illustrations of objectives not attainable by means of a program of physical education (a program of neuro-muscular activities) are: "to increase immunity to diphtheria," "to increase growth of height," "to improve the faculty of reasoning," "to bring about bodily symmetry."

There are two reasons why objectives like those just quoted cannot be attained. The first is that the very nature of things makes their attainment impossible. The above given objectives of "to increase immunity to diphtheria" by exercise, and "to increase the growth of height" by exercise are of this nature. They are as impossible of attainment as the proverbial objective of babes, namely, "to reach the moon by the stretching out of one's hands." In each case, no amount of striving can achieve the objective.

The second reason for the unattainability of some objectives is the very non-existence of the objectives themselves. The above given objectives of "to improve the faculty of reasoning," "to bring about bodily symmetry," are of this nature. They are as impossible of attainment as the objective "to propitiate the ghost of a haunted house." No amount of striving can bring about an objective that has no reality of existence.

All of the attainable objectives of physical education may be listed, but probably all of them should not be listed as attainable by every school program of physical education. What may be attainable under ideal conditions may not be attainable by means of one-half to one hour of physical education per week, and with a probable further limitation of space, equipment, staff, etc.[1] Only such objectives should be listed by *any school* as are attainable *by that school.*

To list any but attainable objectives is to put us in the category of the quacks, and is to be dishonest with ourselves and with the public that supports our efforts. There exists no need for us, in physical education, to inflate our claims. We possess a sufficient number of attainable objectives to justify our existence and to keep us fully occupied.

The second criterion which an objective of physical education must satisfy is that it be *"in harmony with each individual teacher's goal or goals of living."* Attainability, by itself, is an insufficient criterion for the selection of objectives of physical education. While some objectives, such as "to maintain good cardiac efficiency" would receive the approval of all physical educators, while others such as "to develop bulging muscles" would probably receive the disapproval of all physical

[1] It is needless to add here that attainability always means attainability by some individual who has certain characteristics (age, capacity, interest, body type, etc.) and who does his physical education activity under certain conditions (in competition, when fatigued, under compulsion, etc.). In other words, the pupil—the material with which we work—must be considered.

educators, still others, such as "to be able to execute marching tactics" would be approved by some and rejected by others.

This difference of opinion as to the desirability of any objective of physical education is the natural result of two factors. The first is that an objective is always selected on whether or not it leads to some desired goal of living.[2] The second is that there exist honest disagreements as to what goals of living are desirable (are to be desired for our everyday living).

To illustrate, some teachers consider the tennis code of sportsmanship as the desirable one for daily living. Such teachers would hold as proper and strive to bring about the objective "to voluntarily correct an umpire's decision when that decision is *known* to be incorrect, even when the resultant changed decision is to one's own or to one's own team's disadvantage." Other teachers believe that the baseball code of sportsmanship is the more desirable for daily living, and these would heartily disapprove of such an objective as an objective of physical education. In both instances the judgment of the desirability of the physical education objective is made on the desirability of a more general goal to which the objective leads. It is evident that honest and sincere differences as to the *desirability* of any objective of physical education can, do, and will continue to exist. Because of such differences, we can never have, nor is it desirable to have, universal objectives of physical education.

Since the desirability of an objective of physical education is dependent entirely upon the individual teacher's interpretation of what is desirable for present or future living, every teacher must himself select and include in his program only such objectives as will (or are known to) bring about those goals.[3]

It will be said that desirability should be put on the basis of social need and not on each individual's own evaluation. Of course, but each individual's evaluation is dependent upon what he considers the social need to be. Since social need is determined by the gap between the existing condition and some mentally projected goal, and since individuals do have honest differences of opinion as to what goals are and what are not desirable, only individuals' evaluations are ever possible.

For objectives to be in harmony with each individual teacher's goal or goals of living, there must be harmony among all the goals of living held by each teacher, and there must be harmony among the objectives used as means towards the attainment of these goals of living. By "harmony" is meant that there be no contradictions, no inconsistencies, no conflicts, between them. As a first necessary step in the achievement

[2] A teacher may not be conscious of the goals to which any of his objectives leads, but that their acquisition always leads to *some* larger goal is an indisputable fact.

[3] It is understood that the goals and objectives selected are not meant for anybody or everybody but for *his pupils alone.*

of harmony between goals and between objectives striving to reach any single goal, a teacher must consciously and clearly establish the goals toward which he will guide his pupils.[4]

It may be said that this criterion does not help in the actual determination of what objectives are desirable. True. This is, however, in accord with modern educational philosophy and with the scientific spirit of the age which, because of this world being a changing world, aims to provide individuals with workable tools, techniques, and habits of how to solve problems and how objectives are to be arrived at, rather than to provide them with solutions to the problems or a set of arbitrarily arrived-at objectives.

IV

This subcommittee has presented a scheme for the classification of the objectives of physical education. It has offered two criteria for the selection of objectives of physical education, which state that for an objective to be acceptable it must be "attainable" and it must be "in harmony with each individual teacher's goal or goals of living." The subcommittee recommends the adoption of these criteria by the Association.

The subcommittee further offers for approval the objectives which it will strive to fulfill in the years to come, namely, to compile and list all the attainable objectives, to suggest a uniform form of writing or stating the objectives, and to improve and refine the classification scheme presented in this report.

TABLE I

FREQUENCY OF OBJECTIVES OF PHYSICAL EDUCATION LISTED[5]

| Objectives | Frequency | Objectives | Frequency |
|---|---|---|---|
| 1. Health attitudes | 29 | 16. Organic system | 10 |
| 2. Neuro-muscular skill | 27 | 17. Worthy use of leisure | 10 |
| 3. Health habits | 25 | 18. Courage | 9 |
| 4. Correct defects | 22 | 19. Perseverance | 9 |
| 5. Self-control | 16 | 20. Strength | 9 |
| 6. Health | 15 | 21. Attitude for play | 8 |
| 7. Loyalty | 15 | 22. Organic development | 8 |
| 8. Sportsmanship | 13 | 23. Prevent disease | 8 |
| 9. Cooperation | 12 | 24. Discover defects | 7 |
| 10. Leadership | 11 | 25. Functional efficiency | 7 |
| 11. Neuro-muscular habits | 11 | 26. Initiative | 7 |
| 12. Neuro-muscular development | 11 | 27. Poise | 7 |
| 13. Recreation | 11 | 28. Sense of fairness | 7 |
| 14. Character | 10 | 29. Attitude towards physical activity | 6 |
| 15. Citizenship | 10 | | |

[4] It is said by some that no definite goals should be set for our children. Such a condition is impossible of achievement. Even to the most progressive and most "free" educators, such objectives as "to know and apply the fact that this is a changing world," "to make one's own conclusions on the basis of known facts and on considered possible consequences" are considered desirable and are striven for.

[5] The studies of Bookwalter and Foran which were mentioned in last year's report make up part of this list of objectives.

| Objectives | Frequency |
|---|---|
| 30. Honesty | 6 |
| 31. Quick decision | 6 |
| 32. Courtesy | 5 |
| 33. Develop good recreational habits | 5 |
| 34. Endurance | 5 |
| 35. Ethical character | 5 |
| 36. Fair play | 5 |
| 37. Followship | 5 |
| 38. Neuro-muscular abilities | 5 |
| 39. Obedience to law | 5 |
| 40. Physical information | 5 |
| 41. Skills for safety education | 5 |
| 42. Tolerance | 5 |
| 43. Unselfishness | 5 |
| 44. Bring happiness | 4 |
| 45. Cheerfulness | 4 |
| 46. Determination | 4 |
| 47. Develop standards of conduct | 4 |
| 48. Family relationship | 4 |
| 49. Good physical habits | 4 |
| 50. Grace | 4 |
| 51. Organic vitality | 4 |
| 52. Prevent defects | 4 |
| 53. Quick response | 4 |
| 54. Self appraisal | 4 |
| 55. Scientific outlook | 4 |
| 56. Sympathy | 4 |
| 57. Teamwork | 4 |
| 58. Athletic skill | 3 |
| 59. Alertness | 3 |
| 60. Group consciousness | 3 |
| 61. Interpretive-cortical development | 3 |
| 62. Important social, moral, mental qualities | 3 |
| 63. Ideals | 3 |
| 64. Muscular control | 3 |
| 65. Posture | 3 |
| 66. Quick response | 3 |
| 67. Quick perception | 3 |
| 68. Respect for law | 3 |
| 69. Social efficiency | 3 |
| 70. Self-testing | 3 |
| 71. Self-assertion | 3 |
| 72. Self-expression | 3 |
| 73. Sense of honor | 3 |
| 74. Worthy home membership | 3 |
| 75. Accuracy | 2 |
| 76. Attention | 2 |
| 77. Appreciation of beauty | 2 |
| 78. Corrective | 2 |
| 79. Culture | 2 |
| 80. Correction and prevention of abnormalities due to posture | 2 |
| 81. Comradeship | 2 |
| 82. Courteous acceptance of defeat | 2 |
| 83. Desirable habits of conduct | 2 |
| 84. Develop desire for exercise | 2 |
| 85. Exercise | 2 |
| 86. Emotional impulsive development | 2 |
| 87. Ethical and moral | 2 |
| 88. Emotional control | 2 |
| 89. Growth | 2 |
| 90. Give joy | 2 |
| 91. Prevent infections | 2 |
| 92. Responsibility | 2 |
| 93. Social and moral training | 2 |
| 94. Self-reliance | 2 |
| 95. Trustworthiness | 2 |
| 96. Vocation | 2 |
| 97. Willpower | 1 |
| 98. Adjustment to the social world, to assist the individual in making a harmonious | 1 |
| 99. Adult social adjustment | 1 |
| 100. Attitude of enjoyment of at least one out-of-door and one indoor desirable physical activity | 1 |
| 101. Attitude toward life, to develop a proper | 1 |
| 102. Biological objectives | 1 |
| 103. Body mechanism, increased development of | 1 |
| 104. Command of fundamental processes | 1 |
| 105. Coordinating strength and endurance, to secure the more advanced form of | 1 |
| 106. Competitive participation for all boys and girls, to provide opportunity for | 1 |
| 107. Control of health conditions | 1 |
| 108. Develop in the individual initiative, cooperation, leadership, sportsmanship, fair play | 1 |
| 109. Development | 1 |
| 110. Educational | 1 |
| 111. Ethical development by the establishment of high social standards | 1 |
| 112. Functioning of all vital organs, proper | 1 |
| 113. Future citizenship, to make a definite and positive contribution to | 1 |
| 114. Future health | 1 |
| 115. General health and body vigor | 1 |
| 116. General objectives — child and adult interests | 1 |

| Objectives | Frequency |
|---|---|
| 117. Guidance of the fundamental interests and instincts of play | 1 |
| 118. Harmonious development of the body | 1 |
| 119. Healthful habits of living | 1 |
| 120. Hygienic (meaning physiological) | 1 |
| 121. Hygienic school and home life, to promote | 1 |
| 122. Instincts to build character, development of | 1 |
| 123. Intellectual objectives | 1 |
| 124. Interest in other phases of school life, to add | 1 |
| 125. Maturity, to bring every individual to healthful | 1 |
| 126. Knowledge and skill | 1 |
| 127. Mental | 1 |
| 128. Mental and moral qualities, development of | 1 |
| 129. Motor education | 1 |
| 130. Muscular strength and endurance | 1 |
| 131. Nerve and organic power | 1 |
| 132. Neuro-muscular coordination, improved | 1 |
| 133. Organize and guide big muscle activity | 1 |
| 134. Organization and leadership of child life | 1 |
| 135. Physical | 1 |
| 136. Physical development | 1 |
| 137. Poise, to promote bodily and mental | 1 |
| 138. Present health | 1 |
| 139. Prevent and remove handicaps through health supervision and control | 1 |
| 140. Recreative skills, to teach, so as to contribute to education in worthy use of leisure | 1 |
| 141. Seek the fulfillment of possible objectives of development found in big muscle activity | 1 |
| 142. Self-reliance | 1 |
| 143. Set an ideal of health | 1 |
| 144. Social and moral qualities of good citizenship, training in | 1 |
| 145. Smartness, activity and precision | 1 |
| 146. Social service | 1 |
| 147. Social standards | 1 |
| 148. Supervision of sanitation of school plant, to secure the scientific | 1 |
| 149. Vital force and nervous capacity, development of | 1 |
| 150. Admiration for good play by opponents | 1 |
| 151. Aggressiveness | 1 |
| 152. Approval of good play by opponents | 1 |
| 153. Attitude | 1 |
| 154. Body control | 1 |
| 155. Bring cheer | 1 |
| 156. Concentration | 1 |
| 157. Confidence | 1 |
| 158. Cure distortions | 1 |
| 159. Develop muscular system | 1 |
| 160. Enthusiasm | 1 |
| 161. Generosity | 1 |
| 162. Movement in unison | 1 |
| 163. Patience | 1 |
| 164. Patriotism | 1 |
| 165. Politeness | 1 |
| 166. Pupil government | 1 |
| 167. Reliability | 1 |
| 168. Remove deficiencies | 1 |
| 169. Remove defects | 1 |
| 170. Self-confidence | 1 |
| 171. Self-sacrifice | 1 |
| 172. Sentiments | 1 |
| 173. Spirit of the game | 1 |
| 174. Truthfulness | 1 |

# Part II

## Report of Subcommittee II
## Selection and Adaptation of Activities

By Professor Wm. R. LaPorte
*University of Southern California*

Last year's report for this division included a preliminary study used as an experimental technique to be modified by the chairman for the nation-wide study during the year just completed. The study dealt with the attempt to determine the specific fundamentals or performance techniques for the several activities at the various grade levels. The procedure was sufficiently satisfactory to justify going ahead with it for the more extended study, the results of which are presented herewith.

The chairman is operating on the assumption that each activity, such as basketball, is built upon certain basic factors which might logically serve as teaching units. These units represent the items in which skill and knowledge are necessary before the performer can become an effective player. The *dribble* in basketball might be considered as a representative illustration of such a teaching unit.

A second assumption is that after having determined these teaching units it is necessary to weight them relatively as to the amount of time that can justifiably be allotted to them on the basis of their importance or difficulty of learning. For example, the *dribble* in basketball might deserve or require two or three times as much instruction and practice as learning to *catch* the ball.

A third assumption is that, after having determined the appropriate amount of time to be given to each teaching unit, it is still necessary to agree upon the approximate sequence in which these units should be presented for most effective learning purposes. Some units obviously should precede others. In some cases, however, the sequence is not so clear. Experienced teachers have relatively little difficulty with such a problem, but novices often are decidedly confused as to a desirable procedure.

It is true also that even some experienced teachers are not sufficiently well grounded in the fundamentals of certain activities to be capable of making an appropriate selection of teaching units. Some also are not good analysts, and find great difficulty in breaking up an activity into its essential elements. Some have trouble in determining the preferred order of presentation or the relative amount of time to be given each unit. Still others merely follow the line of least resistance and do not bother themselves with the problem of analyzing activities. They simply hand out the ball and bat and let the children play to keep them out of mischief and give them exercise.

As a result of these various weaknesses, some activities are left out of programs entirely, some receive undue emphasis to the neglect of others, and some are presented in inadvisable or ineffective sequence, thus reducing the efficiency of the learning process. A balanced program can be assured only by careful and systematic planning in advance and with appropriate distribution of time and emphasis to the various activities and their several fundamentals.

## PURPOSE OF THE STUDY

The purpose of the present study is to provide for the average teacher an objective analysis of what constitutes the structural skeleton of each activity, to serve as a basis for improved functioning in class situations. It is hoped that the results of this survey of expert opinion may provide a rough criterion or measuring stick to assist the teacher in building a sound program. It is not expected that it will serve as a mechanical device but rather as a guide to class procedures in determining items that need emphasis. It is intended for class instruction for masses and not for coaching techniques for advanced teams.

## METHOD OF PROCEDURE

The method followed in this study involved a questionnaire survey of selected representative leaders throughout the United States and Canada. A very exhaustive questionnaire was sent to members of the College Physical Education Association and other selected city and county supervisors of physical education. One hundred and eighty questionnaires were mailed and one hundred and ten were returned.

The questionnaire respondents were urged to secure assistance where possible from others who were more expert in some of the activities. In a large number of cases this was done. In fact some distributed the activities among the specialists in their institution, city, or state. As a consequence an additional three hundred persons participated in the study, either advising on all activities or taking responsibility for certain ones of the activities in a given questionnaire. This gives a grand total of over four hundred opinions from outstanding leaders included in the evaluation summary.

Each questionnaire included fifty-two different activities, with ten fundamentals under each, two evaluations to be made for each fundamental, a total of 1040 items for each respondent to evaluate. Over 110,000 items had to be scored, totaled and averaged, then adjusted and weighted for the 100 per cent balance and finally rearranged in order of teaching sequence.

The questionnaire was arranged in much the same order as appears in Table I in this report, except that the rating columns were in blank and the order of arrangement was different. The fundamental elements

or teaching units as submitted in the questionnaire were formulated after much laborious study on the part of the chairman, together with extended conferences with representative physical education leaders, and experimental adjustments by members of graduate classes in the University of Southern California.

Merely for purposes of uniformity, each activity was analyzed into ten fundamentals. This was purely arbitrary, but seemed necessary in order to carry on so complicated a study without undue difficulty. This does not mean at all that activities are of equal importance or difficulty. In fact, some activities would deserve many times as much emphasis as others so far as actual time allotment is concerned. This, however, is taken care of in the preceding studies which indicated the amount of time to be given in the several school levels to the various activities. The present study has to do only with the division of time for the several teaching elements within an activity.

Each respondent was asked to indicate, first of all, whether or not he agreed with the list of teaching elements as stated, and if not to scratch out certain ones and replace with additional new ones so as still to retain the number of ten, for purposes of uniformity. Where only a few such changes were indicated, it seemed advisable to retain the original set of units. Each respondent was then asked to indicate, first, his estimate of the percentage of time to be given to each teaching unit, and second, the order or sequence he would prefer for most effective teaching, rating them from one to ten, in order of presentation.

## COMMENTS ON PROCEDURE

It was only natural to expect that there should be many diverse opinions not only as to the study as a whole but as to specific aspects of it. Some felt that their estimates were more or less guess work, but the majority who felt incapable of filling out a given activity left it out entirely. The averages in each case are taken on the basis of the actual number of answers given for each activity and not on the total number of returns. In other words, each unit was handled separately.

Some of the respondents were skeptical of the procedure in establishing definite fundamentals or of determining an exact progression. A few felt that there was danger that over-minute analysis might possibly defeat the purpose of a free, informal approach to instruction in physical activities. This would be a very pertinent criticism if the teaching units as presented were to be followed slavishly in actual instruction. It should be understood, however, that they are to serve as a point of departure, not a fixed procedure. They should be used as a measuring stick in the rough and not as a slide rule or caliper. They should serve as a general guide to the teacher, partly for purposes of inspiring analytical thought, and partly to encourage a more systematic procedure in the instructional field.

It is recognized that any teaching procedure should not be fixed,

but elastic and adaptable to varying needs. There should be possibilities of changing the sequence, if necessary, or of combining two teaching units in one, or of changing the relative amounts of time devoted to given activities according to the needs of a particular group. Even personal peculiarities or unique teaching ideas on the part of the instructor might be sufficient justification for a radical change in a given procedure. Naturally, teachers vary widely in their method of teaching, their emphasis, and their approach.

It is quite impossible to get a large number of representative leaders to agree thoroughly upon any of the three items involved, namely, the selection of units, the sequence of teaching or the relative time allotments. It is exceedingly encouraging, however, that we have had such a cordial response and frank expression of criticism. The important thing is to formulate a reasonable skeleton of subject matter material upon which can be draped the systemic and muscular tissues of teaching to bring about desirable learning processes and citizen outcomes.

## RESULTS OF THE STUDY

The results of the study are presented in detailed form in Table I. It seems unnecessary to interpret these data which represent the composite evaluations of the many participating respondents. The items in each case are arranged in order of sequence for teaching purposes and each teaching unit is given its proportionate percentage value out of a total of 100 per cent for the activity. The figures in each case were secured by adding the total number of scores and dividing by the number of actual raters for that given activity. Hence, the final score is a mean or average.

To make the table more usable, the chairman has inserted under each activity title the grade or school level placement and the amount of time allotted to the activity, as determined in the 1933 curriculum study.[6] For example, elementary swimming was allotted ten weeks during the three years represented in the upper elementary grades, four, five, and six. This could be given all at one time as a solid program, or once or twice a week over a longer period, or it could be distributed over two or three years, if preferred.

It again should be emphasized that the teaching units and scores as indicated should not constitute a fixed mechanical program for any teacher to follow, but rather should serve as a means to strengthen present teaching procedures. It is reasonable to assume, however, at least for the inexperienced teacher, that the composite opinions herewith presented are more significant and valuable than any one teacher's opinion alone.

It is the opinion of the chairman that this material should prove of very great practical value to the average teacher in the field.

[6] Wm. R. LaPorte, "Sixth Annual Report of the Curriculum Research Committee," Proceedings of the 1933 meeting of the College Physical Education Association.

## TABLE I

### Activity Fundamentals

Arranged according to *Teaching Sequence* and *Time Allotment*

Note: The fundamental elements or teaching units in each activity are arranged in order of preferred sequence for most effective teaching. The time allotment indicates the recommended percentage of time to be given the unit out of the total of 100% for all ten units in the activity. This 100% equals the total time allotted the activity for a given school division as indicated in Table I, Time Allotment Chart, of the Sixth Annual Report of the Curriculum Committee. The grade placement and time in weeks appearing herewith under the title of each activity are taken from this table.

### AQUATICS

#### Swimming (Elementary)

| Boys—10 weeks—grades 4–6<br>Girls—10 weeks—grades 4–6 | Teaching Sequence | Time in % |
|---|---|---|
| Getting accustomed to water | 1 | 10 |
| Breathing | 2 | 12 |
| Floating and body position | 3 | 9 |
| Flutter kick | 4 | 13 |
| Crawl stroke arm action | 5 | 14 |
| Scissors kick | 6 | 10 |
| Side stroke arm action | 7 | 10 |
| Back stroke arm action | 8 | 8 |
| Frog kick | 9 | 6 |
| Breast stroke arm action | 10 | 8 |

#### Swimming (Advanced)

| Boys—10 weeks—grades 7–9<br>Girls—10 weeks—grades 7–9 | Teaching Sequence | Time in % |
|---|---|---|
| Review of elementary steps | 1 | 10 |
| Crawl stroke (complete) | 2 | 17 |
| Trudgeon stroke (complete) | 3 | 9 |
| Treading water | 4 | 6 |
| Racing back stroke | 5 | 10 |
| Dolphin breast stroke | 6 | 9 |
| Racing dive | 7 | 9 |
| Racing turns | 8 | 9 |
| Training for meets | 9 | 13 |
| Novelty strokes | 10 | 8 |

#### Diving (Elementary)

| Boys—10 weeks—grades 4–6<br>Girls—10 weeks—grades 4–6 | Teaching Sequence | Time in % |
|---|---|---|
| Preliminary steps | 1 | 9 |
| Position of arms, head, and body | 2 | 10 |
| Breath control | 3 | 7 |
| Recovery after diving | 4 | 6 |
| Kneeling dive from deck curb | 5 | 8 |
| Crouch standing dive | 6 | 9 |
| Straight standing dive | 7 | 11 |
| Standing front dive from board | 8 | 13 |
| Running front dive from board | 9 | 15 |
| Standing back dive from board | 10 | 13 |

DIVING (Advanced)

| Boys—10 weeks—grades 7–9<br>Girls—10 weeks—grades 7–9 | Teaching Sequence | Time in % |
|---|---|---|
| Approach and hurdle | 1 | 10 |
| Take off | 2 | 10 |
| Use of arms | 3 | 8 |
| Position in air | 4 | 8 |
| Entrance into water | 5 | 8 |
| Front dives | 6 | 12 |
| Gainor dives | 8 | 11 |
| Pike dives | 9 | 10 |
| Somersault dives | 10 | 11 |

LIFESAVING (Elementary and Advanced)

| Boys—12 weeks—grades 10–16<br>Girls—12 weeks—grades 10–16 | Teaching Sequence | Time in % |
|---|---|---|
| Surface approaches | 1 | 12 |
| Treading water | 2 | 6 |
| Underwater approaches | 3 | 8 |
| Surface dives and recovery | 4 | 8 |
| Breaks (front and back) | 5 | 15 |
| Disrobing | 6 | 5 |
| Head carries | 7 | 11 |
| Cross chest carry | 8 | 10 |
| Resuscitation | 9 | 16 |
| Tired swimmers' carry | 10 | 9 |

## INDIVIDUAL SPORTS

ARCHERY (Elementary and Advanced)

| Boys—8 weeks—grades 10–16<br>Girls—12 weeks—grades 10–16 | Teaching Sequence | Time in % |
|---|---|---|
| Nocking the bow | 1 | 7 |
| Stance | 2 | 13 |
| Nocking arrow | 3 | 7 |
| Safety precautions | 4 | 11 |
| Drawing bow | 5 | 16 |
| Care of equipment | 6 | 10 |
| Point of aim | 7 | 15 |
| Loosing arrow | 8 | 13 |
| Pause | 9 | 8 |

GOLF (Elementary and Advanced)

| Boys—15 weeks—grades 10–16<br>Girls—15 weeks—grades 10–16 | Teaching Sequence | Time in % |
|---|---|---|
| Grip | 1 | 7 |
| Stance | 2 | 7 |
| Back swing | 3 | 10 |
| Down swing | 4 | 10 |
| Balance | 5 | 8 |
| Follow through | 6 | 9 |
| Tee shots | 7 | 12 |
| Fairway shots | 8 | 11 |
| Approach shots | 9 | 13 |
| Putting | 10 | 13 |

HANDBALL (Elementary and Advanced)

| Boys—15 weeks—grades 10–16<br>Girls—7 weeks—grades 10–16 | Teaching Sequence | Time in % |
|---|---|---|
| Stance and balance | 1 | 8 |
| Contacting ball | 2 | 10 |
| Service | 3 | 10 |
| Right hand strokes | 4 | 11 |
| Left hand strokes | 5 | 13 |
| Playing ball off back wall | 6 | 10 |
| Volleying | 7 | 9 |
| Killing ball | 8 | 9 |
| Singles and doubles play | 9 | 12 |
| English and carom shots | 10 | 8 |

TENNIS (Elementary)

| Boys—9 weeks—grades 7–9<br>Girls—10 weeks—grades 10–12 | Teaching Sequence | Time in % |
|---|---|---|
| Grips | 1 | 6 |
| Receiving stance | 2 | 7 |
| Serving stance | 3 | 7 |
| Forehand drive | 4 | 17 |
| Plain service | 5 | 12 |
| Backhand drive | 6 | 16 |
| Foot faults | 7 | 6 |
| Cut service | 8 | 9 |
| Volley | 9 | 10 |
| Court strategy | 10 | 10 |

TENNIS (Advanced)

| Boys—8 weeks—grades 10–12<br>Girls—10 weeks—grades 13–16 | Teaching Sequence | Time in % |
|---|---|---|
| Review of fundamentals | 1 | 13 |
| Lob | 2 | 9 |
| Half volley | 3 | 7 |
| Chop | 4 | 9 |
| Overhead smash | 5 | 10 |
| Net play | 6 | 11 |
| Singles play | 7 | 12 |
| Doubles play | 8 | 11 |
| Training practice | 9 | 10 |
| Tournament play | 10 | 8 |

TRACK AND FIELD (Elementary)

| Boys—10 weeks—grades 10–12<br>Girls—5 weeks—grades 7–9 | Teaching Sequence | Time in % |
|---|---|---|
| Preliminary training | 1 | 12 |
| Warming up | 2 | 7 |
| Starting form | 3 | 11 |
| Sprinting form | 4 | 11 |
| Finish form | 5 | 7 |
| Standing broad jump | 6 | 8 |
| High jump | 7 | 12 |
| Shot-put (12 pounds) | 8 | 11 |
| Running broad jump | 9 | 11 |
| Relay races | 10 | 10 |

### Track and Field (Advanced)

| Boys—10 weeks—grades 13–16<br>Girls—5 weeks—grades 10–12 | Teaching Sequence | Time in % |
|---|---|---|
| Review of fundamentals | 1 | 10 |
| Middle distances | 2 | 9 |
| Low hurdles | 3 | 10 |
| Distances | 4 | 8 |
| High hurdles | 5 | 12 |
| Pole vault | 6 | 12 |
| Shot-put (16 pound) | 7 | 9 |
| Discus | 8 | 10 |
| Javelin | 9 | 10 |
| Training and officiating | 10 | 10 |

### Squash (Elementary and Advanced)

| Boys—11 weeks—grades 10–16<br>Girls—15 weeks—grades 10–16 | Teaching Sequence | Time in % |
|---|---|---|
| Grip of racket | 1 | 6 |
| Stance | 2 | 7 |
| Serving | 3 | 11 |
| Forehand return | 4 | 13 |
| Backhand return | 5 | 14 |
| Footwork | 6 | 10 |
| Lobbing | 7 | 8 |
| Volleying | 8 | 10 |
| Play off back wall | 9 | 10 |
| Court strategy | 10 | 11 |

### Minor Games

| Boys—15 weeks—grades 4–6<br>Girls—25 weeks—grades 4–9 | Teaching Sequence | Time in % |
|---|---|---|
| Badminton | 1 | 15 |
| Ping Pong | 2 | 11 |
| Horseshoes (quoits) | 3 | 10 |
| Bowling | 4 | 13 |
| Deck tennis (tenniquoit) | 5 | 9 |
| Paddle tennis | 6 | 11 |
| Croquet | 7 | 8 |
| Clock golf | 8 | 8 |
| Tether ball | 9 | 7 |
| Shuffle board | 10 | 8 |

## GYMNASTICS

### Free Exercises (Elementary)

| Boys—5 weeks—grades 4–6<br>Girls—5 weeks—grades 4–6 | Teaching Sequence | Time in % |
|---|---|---|
| Fundamental positions | 1 | 12 |
| Arm bending and stretching | 2 | 8 |
| Head bend—rotating—circumducting | 3 | 7 |
| Trunk bending forward—downward | 4 | 10 |
| Trunk bending sideward | 5 | 9 |
| Leg bending and stretching | 6 | 9 |
| Trunk arching | 7 | 8 |
| Thigh raising and lowering | 8 | 9 |
| Trunk rotation and circumduction | 9 | 10 |
| Combination movements | 10 | 18 |

FREE EXERCISES (Advanced)

| Boys—5 weeks—grades 7–9<br>Girls—5 weeks—grades 7–9 | Teaching Sequence | Time in % |
|---|---|---|
| Review of elementary positions | 1 | 9 |
| Movements—squat rest position | 2 | 8 |
| Movements—front leaning rest | 3 | 8 |
| Movements—sitting position | 4 | 9 |
| Movements—side leaning rest | 5 | 8 |
| Movements—back lying position | 6 | 11 |
| Movements—back leaning rest | 7 | 7 |
| Lunging and charging movements | 8 | 11 |
| Combination movements | 9 | 16 |
| Rhythmical movements | 10 | 13 |

HEAVY APPARATUS (Elementary)

| Boys—5 weeks—grades 10–12<br>Girls—5 weeks—grades 10–12 | Teaching Sequence | Time in % |
|---|---|---|
| Approach and mount | 1 | 9 |
| Dismount and retreat | 2 | 9 |
| Front vaults | 3 | 11 |
| Squat vaults | 4 | 11 |
| Straddle vaults | 5 | 11 |
| Flank vaults | 6 | 11 |
| Wolf vaults | 7 | 9 |
| Rear vaults | 8 | 11 |
| Thief vaults | 9 | 9 |
| Sheep vaults | 10 | 9 |

HEAVY APPARATUS (Advanced)

| Boys—5 weeks—grades 13–16<br>Girls—3 weeks—grades 13–16 | Teaching Sequence | Time in % |
|---|---|---|
| Review of fundamentals | 1 | 11 |
| Uprises | 2 | 10 |
| Upstarts | 3 | 11 |
| Cut-offs | 4 | 9 |
| Circles | 5 | 10 |
| Balance stands | 6 | 10 |
| Levers | 7 | 8 |
| Spotting | 8 | 8 |
| Fly-aways | 9 | 8 |
| Combinations | 10 | 15 |

MARCHING (Elementary)

| Boys—5 weeks—grades 10–12<br>Girls—5 weeks—grades 10–12 | Teaching Sequence | Time in % |
|---|---|---|
| Attention | 1 | 7 |
| Alignments | 2 | 8 |
| Counting off | 3 | 6 |
| Facing (right, left, and about) | 4 | 13 |
| Marking time | 5 | 7 |
| Marching forward | 6 | 13 |
| Halting | 7 | 8 |
| Column right (left) | 8 | 12 |
| Marching to the rear | 9 | 13 |
| Marching by the flank | 10 | 13 |

MARCHING (Advanced)

| Boys—3 weeks—grades 13–16<br>Girls—5 weeks—grades 13–16 | Teaching Sequence | Time in % |
|---|---|---|
| Review of elementary fundamentals | 1 | 11 |
| Fours right (left) and about | 2 | 12 |
| Column right (left) in fours | 3 | 10 |
| Column half right (left) | 4 | 9 |
| Oblique marching (right and left) | 5 | 10 |
| Open order | 6 | 8 |
| Company right (left) and about | 7 | 10 |
| Right (left) front into line | 8 | 11 |
| Double time marching | 9 | 9 |
| On right (left) into line | 10 | 10 |

TUMBLING AND PYRAMIDS (Elementary)

| Boys—4 weeks—grades 4–6<br>Girls—5 weeks—grades 4–6 | Teaching Sequence | Time in % |
|---|---|---|
| Elementary mat work—stunts | 1 | 13 |
| Forward roll | 2 | 8 |
| Backward roll | 3 | 8 |
| Headstand | 4 | 8 |
| Round off and cartwheel | 5 | 10 |
| Handstand | 6 | 11 |
| Handspring | 7 | 12 |
| Pyramid mounts and dismounts | 8 | 10 |
| Two- and three-man pyramids | 9 | 10 |
| Large group pyramids | 10 | 10 |

TUMBLING AND PYRAMIDS (Advanced)

| Boys—10 weeks—grades 7–9<br>Girls—6 weeks—grades 7–9 | Teaching Sequence | Time in % |
|---|---|---|
| Review of elementary fundamentals | 1 | 11 |
| Upstarts | 2 | 9 |
| Somersaults (forward—backward) | 3 | 12 |
| Backward handspring (flip-flop) | 4 | 12 |
| Companion stunts | 5 | 11 |
| Twisters and combinations | 6 | 11 |
| Springboard stunts | 7 | 9 |
| Convex type pyramids | 8 | 8 |
| Concave type pyramids | 9 | 8 |
| Apparatus pyramids | 10 | 9 |

## COMBATIVE ACTIVITIES

BOXING (Elementary)

| Boys—5 weeks—grades 10–12 | Teaching Sequence | Time in % |
|---|---|---|
| Stance and positions | 1 | 11 |
| Advance and retreat | 2 | 9 |
| Slipping, blocking, and ducking | 3 | 12 |
| Leading | 4 | 10 |
| Single blows | 5 | 13 |
| Feinting | 6 | 8 |
| Clinching | 7 | 6 |
| Combination blows | 8 | 11 |
| Training activities | 9 | 10 |
| Ring strategy | 10 | 10 |

BOXING (Advanced)

| Boys—5 weeks—grades 13–16 | Teaching Sequence | Time in % |
|---|---|---|
| Review of elementary steps | 1 | 10 |
| Use of the left | 2 | 13 |
| Use of the right | 3 | 11 |
| Defensive tactics | 4 | 13 |
| Footwork and use of legs | 5 | 11 |
| Counter punching | 6 | 10 |
| Uppercuts | 7 | 7 |
| Crouch and weave | 8 | 8 |
| Training activities | 9 | 10 |
| Left-handed boxer | 10 | 7 |

FENCING (Elementary)

| Boys—5 weeks—grades 10–12<br>Girls—3 weeks—grades 10–12 | Teaching Sequence | Time in % |
|---|---|---|
| Holding foil | 1 | 7 |
| On guard | 2 | 10 |
| Carry | 3 | 7 |
| Advance | 4 | 11 |
| Retreat | 5 | 11 |
| Lunge | 6 | 14 |
| Recover | 7 | 11 |
| Prime | 8 | 10 |
| Seconde | 9 | 9 |
| Tierce | 10 | 10 |

FENCING (Advanced)

| Boys—5 weeks—grades 13–16<br>Girls—5 weeks—grades 13–16 | Teaching Sequence | Time in % |
|---|---|---|
| Review of elementary steps | 1 | 14 |
| Massard | 2 | 7 |
| Quarte | 3 | 9 |
| Leap | 4 | 7 |
| Quinte | 5 | 7 |
| Sixte | 6 | 9 |
| Attacks | 7 | 19 |
| Septime | 8 | 7 |
| Counter parries | 9 | 14 |
| Octave | 10 | 7 |

WRESTLING (Elementary)

| Boys—5 weeks—grades 10–12 | Teaching Sequence | Time in % |
|---|---|---|
| Fundamental positions | 1 | 11 |
| Referee's hold | 2 | 7 |
| Going behind and dropping opponent | 3 | 10 |
| Prevention of injuries | 4 | 7 |
| Neck and head holds | 5 | 9 |
| Training activities | 6 | 9 |
| Nelson holds and combinations | 7 | 11 |
| Pinning positions | 8 | 11 |
| General offensive fundamentals | 9 | 13 |
| General defensive fundamentals | 10 | 12 |

WRESTLING (Advanced)

| Boys—5 weeks—grades 13–16 | Teaching Sequence | Time in % |
|---|---|---|
| Review of fundamentals | 1 | 12 |
| Procedure from defensive position | 2 | 12 |
| Other holds from position of advance | 3 | 11 |
| Double wrist locks | 4 | 7 |
| Holds from in front—kneeling | 5 | 8 |
| Scissor holds and combinations | 6 | 10 |
| Advanced training activities | 7 | 7 |
| Other holds—standing | 8 | 9 |
| Blocks and counters | 9 | 11 |
| Defense against holds | 10 | 13 |

## TEAM GAMES

SPEEDBALL (Elementary)

| Boys—5 weeks—grades 7–9<br>Girls—5 weeks—grades 10–12 | Teaching Sequence | Time in % |
|---|---|---|
| Kicking | 1 | 12 |
| Dribbling | 2 | 12 |
| Positions | 3 | 10 |
| Passing | 4 | 13 |
| Catching | 5 | 10 |
| Kicking-up | 6 | 8 |
| Stubbing | 7 | 8 |
| Guarding | 8 | 11 |
| Pivoting | 9 | 7 |
| Trapping | 10 | 9 |

SPEEDBALL (Advanced)

| Boys—5 weeks—grades 10–12<br>Girls—5 weeks—grades 13–16 | Teaching Sequence | Time in % |
|---|---|---|
| Review of elementary fundamentals | 1 | 12 |
| Heading | 2 | 7 |
| Offense strategy | 3 | 15 |
| Knocking-on | 4 | 7 |
| Defense strategy | 5 | 13 |
| Offense turn plays | 6 | 10 |
| Defense turn plays | 7 | 10 |
| Special plays | 8 | 9 |
| Training tactics | 9 | 8 |
| Leadership and officiating | 10 | 9 |

BOYS' BASKETBALL (Elementary)

| Boys—10 weeks—grades 7–9 | Teaching Sequence | Time in % |
|---|---|---|
| Catching ball | 1 | 8 |
| Push pass | 2 | 9 |
| Two hand underhand pass | 3 | 7 |
| Push or chest shot | 4 | 13 |
| Dribbling | 5 | 9 |
| Underhand loop shot | 6 | 7 |
| Free throw shot | 7 | 9 |
| Individual guarding | 8 | 12 |
| Team offense | 9 | 14 |
| Team defense | 10 | 12 |

BOYS' BASKETBALL (Advanced)

| Boys—10 weeks—grades 10–12 | Teaching Sequence | Time in % |
|---|---|---|
| Review of fundamentals | 1 | 12 |
| Pivoting | 2 | 9 |
| Hook pass | 3 | 6 |
| Bounce pass | 4 | 6 |
| Screening | 5 | 7 |
| Man for man defense | 6 | 13 |
| Fast breaking offense | 7 | 12 |
| Zone defense | 8 | 10 |
| Slow breaking offense | 9 | 12 |
| Team plays | 10 | 13 |

GIRLS' BASKETBALL (Elementary)

| Girls—10 weeks—grades 10–12 | Teaching Sequence | Time in % |
|---|---|---|
| Catching ball | 1 | 10 |
| Chest pass | 2 | 10 |
| Underhand pass | 3 | 9 |
| Bounce pass | 4 | 8 |
| Overhead pass | 5 | 8 |
| Chest shot | 6 | 13 |
| Underhand shot | 7 | 9 |
| Guarding | 8 | 14 |
| Dribbling | 9 | 9 |
| Pivoting | 10 | 10 |

GIRLS' BASKETBALL (Advanced)

| Girls—8 weeks—grades 13–16 | Teaching Sequence | Time in % |
|---|---|---|
| Review of elementary fundamentals | 1 | 11 |
| Receiving ball | 2 | 7 |
| Passing | 3 | 10 |
| Field shooting | 4 | 12 |
| Foul shooting | 5 | 9 |
| Feint or dodge | 6 | 9 |
| Juggle | 7 | 6 |
| Offensive team play | 8 | 14 |
| Defensive team play | 9 | 14 |
| Training | 10 | 8 |

SOFTBALL OR BASEBALL (Elementary)

| Boys—10 weeks—grades 4–6<br>Girls—6 weeks—grades 7–9 | Teaching Sequence | Time in % |
|---|---|---|
| Kicking | 1 | 13 |
| Passing | 2 | 13 |
| Dribbling | 3 | 14 |
| Stopping | 4 | 10 |
| Goal kicking | 5 | 11 |
| Volleying | 6 | 8 |
| Throw-in | 7 | 6 |
| Chesting | 8 | 8 |
| Heading | 9 | 10 |
| Corner kick | 10 | 7 |

Soccer (Advanced)

| Boys—6 weeks—grades 7–9<br>Girls—5 weeks—grades 10–12 | Teaching Sequence | Time in % |
|---|---|---|
| Review of elementary fundamentals | 1 | 11 |
| Position play | 2 | 11 |
| Kicking variations | 3 | 8 |
| Trapping | 4 | 7 |
| Tackling | 5 | 8 |
| Intercepting variations | 6 | 9 |
| Offense strategy | 7 | 13 |
| Defense strategy | 8 | 12 |
| Team plays | 9 | 12 |
| Training | 10 | 9 |

Softball or Baseball (Elementary)

| Boys—10 weeks—grades 10–12<br>Girls—5 weeks—grades 10–12 | Teaching Sequence | Time in % |
|---|---|---|
| Throwing overhand | 1 | 11 |
| Fielding flies | 2 | 11 |
| Throwing underhand | 3 | 8 |
| Fielding ground balls | 4 | 13 |
| Batting | 5 | 19 |
| Catching | 6 | 11 |
| Base running | 7 | 8 |
| Pitching | 8 | 12 |
| Sliding | 9 | 7 |

Softball or Baseball (Advanced)

| Boys—10 weeks—grades 13–16<br>Girls—5 weeks—grades 13–16 | Teaching Sequence | Time in % |
|---|---|---|
| Review of elementary fundamentals | 1 | 11 |
| Infield play | 2 | 12 |
| Playing the bases | 3 | 9 |
| Outfield play | 4 | 8 |
| Advanced pitching | 5 | 10 |
| Bunting | 6 | 7 |
| Base stealing | 7 | 7 |
| Team offense | 8 | 13 |
| Sliding | 9 | 6 |
| Team defense | 10 | 17 |

Football (Elementary)

| Boys—10 weeks—grades 10–12 | Teaching Sequence | Time in % |
|---|---|---|
| Conditioning exercises | 1 | 9 |
| Training rules | 2 | 5 |
| Catching and receiving ball | 3 | 9 |
| Holding ball | 4 | 4 |
| Passing ball | 5 | 15 |
| Tackling | 6 | 15 |
| Stance | 7 | 6 |
| Blocking | 8 | 17 |
| Kicking ball—punt, place, drop | 9 | 11 |
| Foot weave, cut back, line buck | 10 | 9 |

FOOTBALL (Advanced)

| Boys—10 weeks—grades 13–16 | Teaching Sequence | Time in % |
|---|---|---|
| Charging | 1 | 10 |
| Line play | 2 | 14 |
| End play—defensive, offensive | 3 | 12 |
| Guard play—defensive, offensive | 4 | 12 |
| Center play—defensive, offensive | 5 | 12 |
| Backfield play | 6 | 15 |
| Blocking punts and kicks | 7 | 5 |
| Deceptive interference | 8 | 7 |
| Returning kick-off | 9 | 5 |
| Field generalship | 10 | 8 |

TOUCH FOOTBALL (Elementary)

| Boys—6 weeks—grades 7–9 | Teaching Sequence | Time in % |
|---|---|---|
| Passing | 1 | 3 |
| Stance and positions | 2 | 10 |
| Catching | 3 | 12 |
| Running with ball | 4 | 11 |
| Blocking | 5 | 13 |
| Kicking | 6 | 11 |
| Dodging and side step | 7 | 11 |
| Snapper back (center) | 8 | 8 |
| Recovery of fumbled ball | 9 | 6 |
| Fundamental plays | 10 | 15 |

TOUCH FOOTBALL (Advanced)

| Boys—10 weeks—grades 13–16 | Teaching Sequence | Time in % |
|---|---|---|
| Review of elementary fundamentals | 1 | 11 |
| Passing forward | 2 | 10 |
| Pass receiving | 3 | 12 |
| Passing backward—lateral | 4 | 9 |
| Catching kicked ball | 5 | 8 |
| Center pass (spiral—end over end) | 6 | 6 |
| Body block | 7 | 9 |
| Line up formation | 8 | 8 |
| Offense strategy | 9 | 15 |
| Defense strategy | 10 | 12 |

VOLLEYBALL (Elementary)

| Boys—9 weeks—grades 4–6<br>Girls—8 weeks—grades 4–6 | Teaching Sequence | Time in % |
|---|---|---|
| Handling ball | 1 | 12 |
| Underhand service | 2 | 10 |
| Passing ball | 3 | 13 |
| Practice stunts | 4 | 9 |
| Rotation | 5 | 6 |
| Recovering ball from net | 6 | 8 |
| Position play | 7 | 10 |
| Placing serves | 8 | 10 |
| Side-arm service | 9 | 7 |
| Team play | 10 | 15 |

VOLLEYBALL (Advanced)

| Boys—7 weeks—grades 7–9<br>Girls—10 weeks—grades 7–9 | Teaching Sequence | Time in % |
|---|---|---|
| Review of elementary fundamentals | 1 | 11 |
| Handling low ball | 2 | 8 |
| Overhand service | 3 | 9 |
| Handling high ball | 4 | 9 |
| Passing up | 5 | 11 |
| Setting up | 6 | 12 |
| Spiking—"killing" | 7 | 11 |
| Blocking | 8 | 7 |
| Attack | 9 | 11 |
| Defense | 10 | 11 |

FIELD HOCKEY (Elementary)

| Girls—8 weeks—grades 10–12 | Teaching Sequence | Time in % |
|---|---|---|
| Position of readiness | 1 | 7 |
| Free hit | 2 | 8 |
| Stick-stop position | 3 | 9 |
| Dribble | 4 | 14 |
| Drive | 5 | 14 |
| Push pass | 6 | 12 |
| Bully | 7 | 10 |
| Roll in | 8 | 8 |
| Corner | 9 | 10 |
| Penalty bully | 10 | 8 |

FIELD HOCKEY (Advanced)

| Girls—10 weeks——grades 13–16 | Teaching Sequence | Time in % |
|---|---|---|
| Review of elementary fundamentals | 1 | 12 |
| Scoop | 2 | 9 |
| Reverse | 3 | 8 |
| Left-hand lunge | 4 | 10 |
| Jab | 5 | 7 |
| Penalty corner | 6 | 9 |
| Defense tackling—interception | 7 | 14 |
| Offense from bully | 8 | 11 |
| Offense from corner | 9 | 10 |
| Offense from roll in | 10 | 10 |

## RHYTHMICS

FOLK DANCING (Elementary)

| Boys—7 weeks—grades 4–6<br>Girls—10 weeks—grades 4–6 | Teaching Sequence | Time in % |
|---|---|---|
| Polka | 1 | 8 |
| Two-step | 2 | 8 |
| Schottische | 3 | 8 |
| Waltz | 4 | 11 |
| Mazurka | 5 | 8 |
| Gavotte | 6 | 8 |
| American country dance steps | 7 | 15 |
| Minuet | 8 | 9 |
| English country dance steps | 9 | 15 |
| Recognition of folk tunes | 10 | 10 |

FOLK DANCING (Advanced)

| Girls—9 weeks—grades 7–9 | Teaching Sequence | Time in % |
|---|---|---|
| Advanced technique | 1 | 22 |
| Advanced material | 2 | 20 |
| Knowledge of background | 3 | 13 |
| Advanced national dances | 4 | 24 |
| Customs | 5 | 11 |
| Costumes | 6 | 10 |

CLOG AND GYMNASTIC DANCING (Elementary)

| Boys—11 weeks—grades 4–9<br>Girls—10 weeks—grades 4–9 | Teaching Sequence | Time in % |
|---|---|---|
| Threes | 1 | 11 |
| Fours | 2 | 10 |
| Fives | 3 | 12 |
| Sevens | 4 | 11 |
| Waltz fives | 5 | 11 |
| Rubber legs | 6 | 7 |
| Wiggle stick | 7 | 8 |
| Parallel and pigeon toe travel | 8 | 8 |
| Original combinations of fundamental steps | 9 | 11 |
| Simple original compositions | 10 | 11 |

CLOG AND GYMNASTIC DANCING (Advanced)

| Boys—10 weeks—grades 7–12<br>Girls—10 weeks—grades 7–12 | Teaching Sequence | Time in % |
|---|---|---|
| Review of fundamentals | 1 | 12 |
| New combinations | 2 | 16 |
| Advanced technique | 3 | 18 |
| Rhythmic analysis | 4 | 13 |
| Advanced character study | 5 | 11 |
| Original compositions | 6 | 17 |
| Reproduction of rhythmic patterns | 7 | 13 |

NATURAL DANCING (Elementary)

| Girls—10 weeks—grades 10–12 | Teaching Sequence | Time in % |
|---|---|---|
| Swinging | 1 | 9 |
| Percussive | 2 | 8 |
| Locomotor movements | 3 | 13 |
| Vibratory | 4 | 7 |
| Sustained | 5 | 7 |
| Combinations of above | 6 | 12 |
| Elementary creative movements | 7 | 11 |
| Interpretation of music | 8 | 11 |
| Simple compositions | 9 | 12 |
| Interpretation of theme | 10 | 10 |

NATURAL DANCING (Advanced)

| Girls—12 weeks—grades 13–16 | Teaching Sequence | Time in % |
|---|---|---|
| Review of fundamental technique | 1 | 11 |
| Advanced technique | 2 | 16 |
| Different approaches to composition | 3 | 11 |
| Time elements | 4 | 8 |
| Technique of percussion | 5 | 8 |
| Space elements | 6 | 8 |
| Music construction in relation to dance | 7 | 13 |
| Force elements | 8 | 8 |
| Original compositions—solo—group | 9 | 17 |

# Part III

## Report of Subcommittee III
## Determination of Suitable Teaching Situations and Teaching Techniques

By PROFESSOR C. L. BROWNELL
*Teachers College, Columbia University*

At the 1934 meeting of the College Physical Education Association the Chairman of the Subcommittee suggested a slightly revised plan for studying the determination of suitable teaching situations and techniques in the various activities.

The chairman requested permission to change the technique from the experimental approach to an analysis of situations and techniques used by the outstanding leaders in the various fields of activity. It is believed that the experimental approach does not lend itself, without years of investigation, to the study at hand, due to the lack of objective measuring instruments which would determine accurately the superiority of one technique or method over another.

The Association favored the plan of study proposed above, and it was agreed that we would select five activities from Professor LaPorte's list, initiating the investigation of the determination of suitable teaching situations and techniques in these activities. To this end the following sports were selected: football, basketball, baseball, tennis and swimming.

A letter was sent to all members of the College Physical Education Association asking them to suggest the names of persons who, by training and experience, had demonstrated their ability in each of the activities selected. Obviously, men who have proved their ability in giving instruction in these activities (either as coaches or teachers) possess a wealth of knowledge which would be of value to the profession if it were properly analyzed, organized, and made available through the medium of the College Physical Education Association.

The letter follows:

April 18, 1935

Dear—

As a fellow member of the College Physical Education Association, may I urge you to give this letter your immediate attention?

For several years the Association has sponsored a Committee on Curriculum Research under the able leadership of Professor Wm. R. LaPorte. This Committee has prepared a list of suitable activities in physical education for various grade levels, and these activities have been placed in rank order on the basis of student interest and expert judgment. Recently, the work of the Committee has been divided into five Subdivisions. It is with Division III, Determination of Suitable Teaching Situations and Techniques that this letter is concerned.

As Chairman of this Division, I am desirous of obtaining the services of outstanding leaders in the various activities. Your assistance is requested in the selection of these men.

Briefly, the plan is as follows:

1. For 1935, it is proposed that we study the Teaching Situations and Techniques of the first five activities appearing on Professor LaPorte's list for college students; they are: football, basketball, baseball, tennis and swimming. Progress reports on the five events will be presented at the next annual meeting of the Association.

2. Obviously, men who have demonstrated their ability in giving instruction in these activities (either as coaches or teachers) possess a wealth of knowledge which would be of value to the profession if it were analyzed, organized, and made available through the medium of the College Physical Education Association.

3. One outstanding leader in each activity will be selected from the recommendations of members of the Association. This person will be invited to serve, with those chosen for each of the other activities, as a central committee on Teaching Situations and Techniques. The central committee will formulate general plans for pursuing the study of each event, to insure some uniformity in the reports submitted.

4. Besides the central committee proposed above, four additional persons of exceptional ability will be appointed in each event.

5. Thus we shall have a subcommittee composed of five men in football, basketball, baseball, tennis and swimming, respectively. It will be their task to organize the teaching situations and techniques of the activities selected, and to prepare a report for the next meeting of the Association.

6. On the enclosed sheet will you kindly suggest the names of three men for each event listed? In making your selection please keep in mind the following qualifications: (*a*) demonstrated ability in teaching or coaching the particular sport; (*b*) knowledge of the activity; (*c*) ability to analyze the teaching situations and techniques involved; (*d*) ability to work with others on the subcommittee; (*e*) ability to organize and formulate the report for use by the Association.

The inestimable value of these reports to physical education is at once apparent. If the subcommittees are carefully selected we may look forward to several interesting presentations at the annual meeting next December. As

soon as these subcommittees are operating smoothly, other groups will be organized to study the remaining activities appearing on Professor LaPorte's list.

This letter is being sent to all members of the Association.

Cordially yours,

C. L. BROWNELL, Chairman
Division III, Determination of Suitable Teaching Situations and Techniques of Committee on Curriculum Research

From these data one outstanding leader in each activity was selected and asked to serve as Chairman of the following committees: *Football*—H. O. Crisler, Princeton University; *Basketball*—Nat Holman, City College of New York; *Baseball*—Ethan Allen, Philadelphia National League; *Swimming*—R. J. Kiphuth, Yale University; *Tennis*—Mercer Beasley, Princeton University.

It is worthy of note that acceptances were received from the first expert asked to serve as Chairman in his field.

Following the appointment of the various chairmen, conferences were held with them either in person or by letter for the purpose of selecting the members of their respective subcommittees. Four additional persons of exceptional ability have been sent letters inviting them to serve on these committees. The letters are signed by both the Chairman of Division III and the Chairman of the respective sports committee. Thus we shall have a subcommittee composed of five men in football, basketball, baseball, tennis, and swimming respectively.

As soon as the various committees are intact, a general plan will be established for the determination of suitable teaching situations and techniques in the sports selected. Beyond this general plan each committee will be allowed to carry on its work according to individual needs and interests.

It is recommended that we continue for another year with the five activities listed above. When these reports have been completed we shall proceed with the study of the remaining activities appearing on Professor LaPorte's list.

As stated in the letter of the chairman to the members of the College Physical Education Association, it is believed that the proposed plan of investigation will be of inestimable value to physical education.

At this time the chairman wishes to express his sincere gratitude to Messrs. Emanuel Munn Ziegler and George Evans, who have made valuable contributions to the work of this Committee.

## Part IV

## Report of Subcommittee IV
## Formulation of Standardized Achievement Tests

By Professor Frederick W. Cozens
*University of California at Los Angeles*

The report for the year 1934 as published in the Proceedings of the Association outlined (1) the classification of college men according to a height-weight division, (2) standardized directions for giving thirty-five individual tests, and (3) procedures used in the construction of achievement scales for these thirty-five tests. This material has now been published, thus making the entire group of scales available to all.[7]

This year the particular interest of the committee has been turned toward the setting up of test batteries to measure fundamental skill in (*a*) swimming, (*b*) gymnastics, (*c*) individual sports such as handball and archery, and (*d*) team games, particularly basketball and touch football.

Graduate students are now at work on criteria for evaluating ability in these various activities and in the collection of data for setting up standardized test batteries. It is the hope of your chairman that material progress can be reported in 1936. Of the studies now under way, one by Professor Stanley Borleske of Fresno State College, California, on touch football is practically completed and should be ready for publication shortly.

## Part V

## Report of Subcommittee V
## Establishing Appropriate Administration Standards

By Professor Frank Lloyd
*New York University*

This subcommittee reports progress and hopes to have definite standards available in 1936.

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[7] Frederick W. Cozens, *Achievement Scales in Physical Education Activities for College Men*, (Philadelphia: Lea & Febiger, 1936).

# A Study of the Promotion and Organization of Leisure-Time Interests and Activities in Small Towns and Rural Communities

By Charles A. Murdaugh
*University of Wisconsin*

## INTRODUCTION

THIS project has been set up under the supervision of Professor G. S. Lowman, Director, Division of Physical Education at the University of Wisconsin, in order to make a study of the definite recreational needs and interests for rural communities and small towns.

During the past decade or more, all efforts and work have been largely in relation to emphasizing leisure-time interests and activities for the urban group. Recreational systems have been built up, giving the urban people opportunities to use their leisure time socially, physically, and mentally. Music, art, dramatics, athletics, speech, and other activities have been promoted and organized, and much study and research have been directed for the benefit of recreational and leisure-time interests and activities for urban populations. The rural population has been pushed into the background, and, except in a few instances, the realization that rural people are in need of leadership and organization of recreation and leisure-time interests and activities has not been supported by those people in a position to help and assist them.

People in small towns and rural communities need the benefits derived from recreational activities fully as much as the urban dweller. They derive inspiration from physical activity, dramatics, singing, and other activities the same as the people who live in the large cities. This study is an attempt to ascertain just how much or how little is being done for the rural group; or what is necessary in the way of promotion and organization to give the rural people the opportunities now afforded the urban population.

## PROMOTION OF LEISURE-TIME INTERESTS BY STATE AGRICULTURAL EXTENSION DEPARTMENTS

A questionnaire was sent to the directors of agricultural extension in the state universities and colleges of the forty-eight states, requesting information on their contributions to the leisure-time interests and opportunities of small-town and rural communities: the departments doing such work, the activities promoted by each department, and the general

plan of organization, including the use of local or special leadership. Following is a summary of the replies to this questionnaire.

### STATES REPORT

Forty-eight questionnaires sent out.
Thirty-one returned.
Twenty-four colleges or universities promote study.
Three do not.

### DEPARTMENTS AND NUMBER OF STATES PROMOTING ACTIVITIES

| *Department* | *States* |
|---|---|
| 1. 4-H Club Department | 25 |
| 2. Physical Education Department | 5 |
| 3. Music Department | 5 |
| 4. Speech and Dramatic Department | 6 |
| 5. Rural Sociology Department | 8 |
| 6. Agricultural Extension Division | 23 |
| 7. Home Economics Extension | 2 |
| 8. Agricultural Education | 1 |
| 9. Home Demonstration Department | 1 |
| 10. Forestry Department | 1 |
| 11. University or College Extension Department | 4 |
| 12. County Agents | 1 |
| 13. Y.M.C.A. | 1 |
| *Leadership* | |
| Local | 24 |
| Special | 12 |
| No Statement | 7 |

### ACTIVITIES CONDUCTED BY DEPARTMENTS

*4-H Club Department*

1. Music
   - *a*) Vocal
   - *b*) Bands
   - *c*) Orchestra
   - *d*) Appreciation
   - *e*) Choruses, etc.
2. County Rallies
3. Plays—Dramatics
   - *a*) Drama groups
   - *b*) State tournaments
4. County meetings
5. Tours
   - *a*) Club
   - *b*) Fair
6. Achievement days
7. Organized games
   - *a*) Active and quiet
   - *b*) Group
8. Playdays
9. Folk dancing
10. Social dancing
11. Recreation associations
12. Cooking
13. Sewing
14. Handicraft
15. Gardening
16. Camping
    - *a*) County
    - *b*) Community
    - *c*) Women camps, etc.
17. Parties
18. Club meetings
19. Hikes
    - *a*) Nature
    - *b*) Outings
20. Swimming
21. Baseball
    - *a*) Teams
    - *b*) Leagues
    - *c*) Kittenball tournaments
22. Picnics
23. Recreation training institute schools

24. Program
    a) Community
    b) Village
    c) County
25. Leaders' training courses
26. Exhibits
27. Fairs
    a) County
    b) Community
    c) 4-H Club, etc.
28. Issue recreational material
29. Wild life (botanical plant identification)
30. Forestry
31. Box suppers
32. Community and county athletics
33. Marches
34. Mother recreation camps
35. Books and magazines
36. Home-talent festivals
37. Book reviews
38. Health exercise and instruction
39. Recreation councils
40. Education
41. Self-improvement
42. Better living conditions
43. Demonstrations
44. Judging contests
45. Book-lovers' clubs
46. State 4-H Club conventions
48. Room arrangement
49. Room furnishing
50. Stunts

*Physical Education Department*

1. Courses in health and physical education
2. Furnish playground instructors
3. Organize track meets and other athletic events
4. Take charge of games on special occasions
5. Charge of game contests

*Music Department*

1. Music tournaments
2. County choruses
3. Judge contests
4. Presentation of operas and musical programs
5. Training for local music directors

*Speech and Dramatic Department*

1. Group discussions
2. Drama contests
3. Classes
4. Drama institute
5. Make-up demonstrations
6. Character development demonstrations
7. Conversation demonstrations
8. Community drama
9. Circulating library of popular plays
10. Train students for dramatic programs in home towns.

*Rural Sociology Department*

1. Drama
    a) Training schools
    b) Tournaments
2. Issue bulletins on community activities for use in small communities.
3. Music
    a) Choral singing
    b) Community singing
    c) Tournaments
    d) State rural chorus (at state fair)
4. Community picnics
5. Community meeting programs

6. Recreation institutes
7. Public discussion teams
8. Rural youth programs
9. Lecture series
10. Assist P.T.A., rural church, and other organizations
11. Training school for 4-H Club directors in dramatics
12. Training school for leaders in community recreation
13. Organization of annual drama festival for adults
14. Organization of annual drama festival for 4-H Clubs
15. Discussions
    a) Farm organization
    b) Study and discussion of:
        1. Taxation
        2. Rural education
        3. Town and county government
        4. A.A.A.
        5. Dairy marketing
16. Recreation
    a) Playground softball
    b) Folk dancing
    c) Playdays
    d) Picnics
    e) Field days
    f) Summer recreation camps
    g) County recreation programs
        1. Winter camps
        2. Indoor sport contests
        3. Swimming meets
        4. Men and women baseball leagues

*University or College Extension Division*

1. Music
    a) Appreciation
    b) Tournaments
    c) County and state rural choruses
    d) Clubs
    e) Orchestras
    f) Quartets
    g) Bands, etc.
2. County recreation rally
3. Organized play at county meetings
4. Stunts
5. Dramatics
    a) Lending libraries (plays and lists of plays)
    b) Tournaments
6. Recreation institutes
7. Speech
    a) Public discussion teams
    b) Public speaking classes
8. Rural youth programs
9. Cooking
10. Sewing
11. Organized group games
12. Handicraft
13. Gardening
14. Reading courses
15. Picture study—art appreciation
16. Furniture renovation
17. Homemakers' clubs
18. Monthly training for leaders
19. Camps
    a) Homemakers
    b) Recreation
    c) Mixed group
20. Folk dancing
21. Farm bureau picnics
22. All 4-H Club activities
23. Harvest dinners
24. Community meetings
25. Achievement programs
26. Work units:
    a) Basketry
    b) Mattress making
    c) Quilting, etc.
27. Schools
28. Community center programs
29. Club fairs
30. Magazine and book exchange

31. County-wide recreation schools
32. Demonstrations
33. Educational meetings
34. Assist in fairs
35. Judging contests
36. Radio programs
37. Women's clubs
38. District training schools
39. Entertainments
40. Community sports
41. Community parties
42. Health activities
43. Tours
44. Rally days
45. Economic consciousness
46. Remodeling and refurbishing furniture
47. Remodeling and refurbishing clothing

*Home Economic Extension Division*

1. Recreation in Home Bureau units
2. County choruses (coop. of Rural Sociology Dept.)
3. Family or community nights
4. Leisure hour projects
5. Household arts
6. Crafts
7. Bulletins on recreational reading
8. Camps
   *a*) Physical relaxation
   *b*) Entertainment
   *c*) Music, etc.

*Agricultural Education*

1. Father-and-son banquets
2. Community fairs
3. Athletic contests
4. Drama contests
5. Oratorical contests

All carried on by the "Future Farmers of America."

*Home Demonstration Department*

1. Singing
2. Cooking
3. Sewing
4. Dramatics
5. Organized games
6. Handicraft
7. Gardening
8. Reading courses
9. Picture study
10. Furniture renovation
11. Upholstery

*Forestry Department*

1. Leaders' training in camp-craft

*County Agents*

1. Agricultural Extension Division works through the county agents.

*Y.M.C.A.*

1. Games
2. Movies
3. Swimming
4. Volleyball

*Public and Private Agents*

1. Promote activities already listed under the above departments, which are desired.
2. Camps.

## PROMOTION BY WISCONSIN COUNTIES

A similar questionnaire was sent out to the seventy-two county school superintendents of Wisconsin. The answers received are summarized below.

### REPORT ON WISCONSIN COUNTIES

Answers Received—43 out of 72

| *Agencies Promoting Activities* | *Number* |
|---|---|
| 1. 4-H Clubs | 35 |
| 2. Recreation supervisor | 4 |
| 3. Music supervisor | 13 |

| | | |
|---|---|---|
| 4. Speech and dramatic supervisor | | 8 |
| *a*) Speech | 10 | |
| *b*) Dramatics | 12 | |
| 5. Y.M.C.A. | | 4 |
| 6. Agricultural Extension work | | 23 |
| 7. School systems | | 25 |
| *a*) Elementary | 20 | |
| *b*) High School | 19 | |
| *c*) Normal | 11 | |
| *d*) County Agricultural School | 2 | |
| 8. Rural organizations | | 33 |
| *a*) P.T.A. | 19 | |
| *b*) Community clubs | 14 | |
| *c*) Farmers' union | 4 | |
| *d*) Rural women's clubs | 3 | |
| *e*) Homemakers' clubs | 3 | |
| *f*) Hi-Y | 3 | |
| *g*) Mothers' clubs | 3 | |
| *h*) Future Farmers of America | 2 | |
| *i*) Farm Bureau | 2 | |
| *j*) Boy Scouts | 2 | |
| *k*) Junior Farmers' Union | 2 | |
| *l*) County Dramatic clubs | 1 | |
| *m*) Granges | 1 | |
| *n*) Aid Societies | 1 | |
| *o*) Farmers' Clubs | 1 | |
| *p*) Rural Federation | 1 | |
| *q*) Farm bureau band | 1 | |
| *r*) Home service clubs | 1 | |
| *s*) Girl reserves | 1 | |
| *t*) Girls' clubs | 1 | |
| *u*) Red Cross chapters | 1 | |
| *v*) Drama festival for county | 1 | |
| Counties: Promote | | 31 |
| Do not promote | | 9 |
| Did not signify | | 3 |
| Desire study | | 32 |
| Do not | | 2 |
| Did not signify | | 8 |
| Leadership: Local | | 28 |
| Special | | 13 |
| No statement | | 12 |

## ACTIVITIES CONDUCTED BY DEPARTMENTS

### *4-H Club Work*

1. Music
   - *a*) Orchestra
   - *b*) Band
   - *c*) County music festival
   - *d*) Choruses
2. Dramatics
   - *a*) County drama festival
   - *b*) Plays
3. Tours and trips
4. Social gatherings
5. Winter activities
6. Projects
7. Sewing
8. Canning
9. Calf and alfalfa clubs
10. Junior forest rangers
11. Miscellaneous clubs
12. Socials

13. 4-H club fair
14. Recreation
15. Baseball and kittenball
    *a*) Tournaments (state and county)
    *b*) Leagues
16. County leaders training school
17. Athletics
    *a*) Volleyball
    *b*) Basketball
    *c*) Playgroundball
    *d*) Tournaments in *a*, *b*, and *c*.
    *e*) Track meets
    *f*) Indoor skill games (tournaments)
18. Exhibits
19. Programs
20. Picnics
21. Summer camps
22. One-day outings
23. Trips
24. Dances
25. Hikes
26. Cooking
27. Speaking
28. Evening group meetings
29. Home economics days
30. Achievement days
31. Scrapbooks
32. Reading
33. Livestock judging contests
34. Home beautification
35. County demonstration work
36. Gardening

*Home Economics Extension Work*

1. Hot lunches in the schools
2. Miscellaneous clubs
3. Dress forums
4. Cooking schools
5. County leaders' training schools
6. Demonstration work
7. Help at fairs
8. Games (group)
9. Music
    *a*) Appreciation
    *b*) Contests
10. Vocational classes
11. Discussion
12. Conduct fairs
13. Flower shows
14. Social gatherings
15. Night classes
16. Remodeling clothes
17. Canning
18. Sewing
19. Baking demonstrations
20. County achievement days
21. Folk dancing
22. Folk songs
23. Community recreation
24. Reading in the home
25. Handicraft
26. Camps
27. Playdays
28. Dramatics
29. Pageants

*Agricultural Extension Work*

1. Soil testing
2. Lectures
3. Cattle testing
4. Judging contests
5. Farmers' Institutes
6. Seed and weed contests
7. Breed associations
8. Homemakers' clubs
9. Vocational classes
10. Night classes
11. County public discussion work
12. County fair
13. Home beautification
14. Reading
15. 4-H clubs
16. Aid Boy Scouts
17. Motion pictures
18. Wild life from recreational point of view
19. County music festival
20. County drama and drama contests
21. Baseball
    *a*) Associations
    *b*) Leagues
    *c*) Kittenball
22. Music contests
23. Novelty contests
24. Stunts
25. Summer camps
26. Games

*School Systems*

1. Drama
    *a*) Annual play
    *b*) Contests
    *c*) Courses and plays
2. Programs
3. Demonstrations
4. Annual playdays
5. Township playdays

6. Exhibit day
7. School forests
8. Miscellaneous clubs
9. Assist in community and P.T.A. programs
10. Speech
    *a*) Debates
    *b*) Public speaking
    *c*) Oratorical contests
    *d*) Forensic work, etc.
11. Music
    *a*) Musical programs
    *b*) Singing
    *c*) Children's choruses
    *d*) Teachers' choruses
    *e*) Bands
    *f*) Orchestras
    *g*) Quartets
12. Aid in community fairs
13. Spelling contests
14. County fair exhibits
15. Holiday programs
16. Evening school
17. Lectures
18. County contests
19. Playdays
20. Various contests
21. Art contests, etc.
22. Modeling
23. Reading
24. Boy Scouts
25. Camp Fire
26. Athletics
    *a*) Baseball and tournaments
    *b*) Basketball and tournaments
    *c*) Volleyball and tournaments
    *d*) Football
    *e*) Marbles and tournaments
    *f*) Jacks and tournaments
    *g*) Folk Dancing
    *h*) Playground games
        1. Organized and constructive

*Rural Organizations*

1. Music
    *a*) Bands
    *b*) Organize school bands
    *c*) Group singing—county choruses
2. Debates
    *a*) Aid in county public speaking tournaments
    *b*) Aid in county discussion tournaments
3. Dramatics
    *a*) Aid in county drama tournaments and contests
    *b*) Plays
    *c*) Programs
    *d*) Organizations exchange each other's programs
4. Spelling contests
5. Schoolground development
6. Community programs
7. Community gatherings
8. Dinners
9. Fairs
10. Exhibits
11. Child welfare
12. Hot lunches for school children
13. Provide school equipment
14. Provide dental care
15. Provide toxin and antitoxin
16. Card playing
17. Athletics
    *a*) Softball
    *b*) Indoor baseball leagues
    *c*) Dartball
    *d*) Games (group) organized

*Speech and Dramatic Supervisor*

1. Drama leagues
2. Annual drama contests
3. Discussions
4. Public speaking
5. County public discussion tournament
6. Oratorical contests
7. Declamatory contests
8. Oratory
9. Debates
10. Extemporaneous speaking
11. Speech contests
12. Forensics
13. Plays
14. County drama festival
15. Drama school
16. Play contests
17. Communities exchange plays
18. Drama clubs

*Y.M.C.A.*

1. Swimming
2. Clubs—Hi-Y, Nature, Boy Scouts, etc.
3. Camps

*Recreation Supervisor*

1. County field day for rural schools
2. Night ball
3. Dartball leagues
4. Volleyball leagues
5. Basketball leagues
6. Social centers
7. Playdays
8. County basketball, baseball, and kittenball tournaments — Classes *A*, *B*, and *C*.
9. Drama
10. Music
11. Games for small children

*Music Supervisor*

1. Annual music festival County and for schools
2. Bands (rural and village)
3. Rural school music contests
4. Community music tournaments
5. Vocal
6. Operettas
7. Civic choruses
8. Choral singing
9. Instrumental instruction
10. Orchestra work
11. Harmonica orchestras
12. Rhythm bands
13. Glee clubs
14. Choruses
15. Music instruction
16. Cantatas
17. Community singing

*County Superintendent's Office*

1. Library service
2. Education films
3. Special speakers for weekly meetings
4. Drama—Community plays
5. Night schools—music, etc.

*County Agent*

1. Community plays
2. 4-H club work

*F.E.R.A. Director*

1. Community plays
2. Night schools
3. F.E.R.A. workers while employed carried on various activities as under "Recreation Supervisor."

*Sources from which Counties Received Material*

1. Departments at the University of Wisconsin (Agr. School mostly)
   *a*) Rural sociology
   *b*) State 4-H Club Department
   *c*) University Extension Division
   *d*) Physical Education Department
   *e*) Speech and Dramatic Department
   *f*) Music Department
2. Various commercial agencies—drama especially
3. National P.T.A. council
4. Local recognized leaders of various activities
5. Locally
6. Public libraries
7. County extension office
8. State superintendent of schools
9. Home talent
10. County library
11. Local purchase by director
12. Y.M.C.A.
13. Speakers—Local professional men and women—U.W. representatives
14. Sample copies of different magazines
15. Traveling library
16. Publishing companies
17. State Department of Public Instruction
18. County Superintendent's Office
19. United States Dept. of Agriculture
20. County Agent's Office
21. Breed associations
22. Homemakers
23. Through the state
24. Wherever possible—National Recreation Association also.

*Counties Indicating Want of Aid*

1. Taylor County.—Many parts of county do not have opportunities such as around Medford.

2. Rusk County.—"We would be very glad to have a trained leader because we are really too overloaded to carry the extra load."

3. Sawyer County.—Does not promote now. "We hope to do more of this kind of work when our new county agent takes office the first of the year."

4. Florence County.—"The young people plan their own amusements. We are in need of leadership."

## CONCLUSION

In noting the activities sponsored by the various departments, agencies, and supervisors, it will be seen that there is lack of a definite centralized system for the promotion and organization of leisure-time opportunities. To say that there is nothing being done for the rural population would not be true, yet it is clearly evident that not enough is being done, and that there is a definite need for leadership in this field.

According to the survey, the number of ruralists not receiving the benefits of organized leisure-time opportunities outnumbers those who do. The work generally being done in this field seems to be centralized in the towns and villages of the counties, while those people who live some distance from these districts and in outlying parts of the counties are not benefited. One of the problems confronting us is to arrange and organize in such manner as to reach and offer one and all the leisure-time benefits which are needed by the rural people as much as they are needed by the urban people.

In order to achieve this goal, a centralized system for the promotion and organization of leisure-time interests and activities is needed for the state. Under a system such as this, leaders can be sent out and programs planned and set up to reach those who now do not have these opportunities.

As it is now, there is much overlapping of activities by the various departments, agencies, and organizations, and all without regard to the needs of the community. Knowing that sufficient leadership cannot be had to accomplish what we wish to do, a plan must be set up in our provision of leadership to provide opportunities for creative leadership —in other words, a type of direction which offers opportunity to the public at large to come in and accept responsibilities for performing volunteer tasks and assisting in the program. Leadership may be found in any community, and should be developed.

With the decreased working time that we now have, to solve the problem of using the increased leisure hours worthily is vitally important. A state-wide recreational supervisor and board should be set up to do away with the disparity now in existence, and to provide leisure-time opportunities for all. Some of our eastern states just recently have established state directors of public recreation under the State Depart-

ment of Public Instruction, organizing recreation largely on a county basis.

In making this study two questionnaires were prepared listing departments, agencies, and supervisors that might be doing recreational work in small towns and rural communities. Forty-eight questionnaires were sent to Directors of Agricultural Extension in state universities and colleges, and seventy-two questionnaires were sent to the county school superintendents of each county in the state of Wisconsin.

Of the forty-eight questionnaires sent to the Directors of Agricultural Extension in state universities and colleges, thirty-one answers were received. Twenty-four of these states do promote leisure-time interests and activities, while three do not. The others gave no indication whether they promote such activities or not.

Of the seventy-two questionnaires sent to the county school superintendents of each county in Wisconsin, forty-three answers were received. Of these forty-three, thirty-one do promote recreational activities, nine do not, and three did not signify.

I wish to express my appreciation to those who so kindly answered the questionnaires sent to them. That there is a real desire to better the existence of rural peoples is self-evident in looking back over information received from the various colleges and universities. Many of our state counties came nobly to our aid in this study, and the interest expressed in the questionnaires received is tremendously encouraging, and indicates that progress is under way.

Credit is also due Professor A. L. Masley, Department of Physical Education, University of Wisconsin, and Professor A. F. Wileden, Department of Rural Sociology, University of Wisconsin, for their aid in preparing the questionnaires and in the contribution of other valuable information to the study.

# BOOK REVIEWS

ATLAS OF HUMAN ANATOMY, with explanatory text by Jesse F. Williams, M.D. Colored Illustrations by Franz Frohse, Max Brödel, and Leon Schlossberg. (New York: Barnes and Noble, Inc., 1935). 62 pages. $1.25 paper covered; $2.00 in cloth.

Physical education, of course, includes a thorough knowledge and understanding of the human body. As the author of this book says, "To become better acquainted with man as a body is not only a source of intellectual delight and satisfaction but would appear to be one way at least in which one could approach the study of how to live."

How are we "put together"? What makes us go? Where is "this or that" part located? What role does it play in the functioning and health maintenance of the body?

Answers to these questions are made interesting and understandable by the author and the artists who have given us this compact little book. Dr. Williams, who prepared the text, says it "is designed for both the layman and the student."

Written in simple, direct style, the introduction explains the embryological development and growth of body cells. The skeletal system is outlined in clear detail. Excellent drawings show growth of bony structures such as the skull and the vertebrae of the spine.

Over this framework stretch various kinds of muscles which make possible the body's activities. The type and function of each are discussed; even a "pulled" muscle, which occurs in athletes, is given consideration.

Readers follow with interest the circulation of the blood throughout the body. The intricacies of the nervous system provide fascinating reading which is simple enough for the lay person to comprehend. The way that the digestive tract takes care of the food which is eaten and nourishes the body; how the respiratory system functions and elimination of waste matter takes place are all included in the preliminary script. The generative organs, male and female, and the endocrine glands complete the text part of the book.

Then are shown the illustrations, many of which are reduced size reproductions of the internationally famous Anatomical Charts by Franz Frohse, the originals of which are life size and in some instances even larger. Front and rear views of the human skeleton are shown. Each bone and joint is numbered and named with not only the nomenclature used in everyday language but the Latin terminology as well. The front and back views of the body covered with muscles and tendons show the parts being identified in the same way as mentioned above.

Then the nervous system is shown in complete detail. The following page gives a median section of the head. Here the use of many colors is introduced. Health workers who wish to show their students the location of sinuses, tonsils, etc., will find this picture very helpful. The brain and base of the skull are followed by the schema of circulation which portrays clearly how the blood is carried from the heart throughout the body and back again for purification. The next page shows the complete circulation system. Then the heart is broken down into small parts for minute examination. This is followed by the circulation system of the head.

The way that the body looks inter-

nally in the chest and abdominal regions is made to appear very attractive by the five artistically colored illustrations, each of which is fully explained. The neck, mouth, and jaw are considered in four illustrations; then the ear and the eye are studied. The genital organs of both the male and female are shown in the next several colored illustrations. The exact function of the skin is the last of this interesting collection of drawings.

The Anatomical Charts of Franz Frohse have long been popular among instructors of physical education. These are supplemented by charts of the American Series made by Professor Max Brödel of the Johns Hopkins Medical School. Four additional ones were especially drawn for the "Atlas of Human Anatomy" by Leon Schlossberg, of Johns Hopkins, with Professor Brödel's cooperation.

A selected bibliography and reference index complete this valuable book.

BEULAH FRANCE, R.N.
*New York City*

ADMINISTRATION OF HEALTH AND PHYSICAL EDUCATION IN COLLEGES. William L. Hughes, Ph.D. (New York: A. S. Barnes and Company, 1935), 368 pages, $3.00.

Dr. Hughes presents a comprehensive and scholarly treatment of his specialized interest in the above publication. *Administration of Health and Physical Education in Colleges* has been listed in The Sixty Educational Books of 1935 prepared by the American Library Association and *The Journal of The National Education Association*. This honor is indeed justified; its value to the profession has been established in the few months since its appearance. It has gained acceptance and has received favorable comments from practically every college department of physical education in the country. Teachers in the professional schools have found it particularly useful in acquainting their students with this important administrative phase of our work.

This volume brings together desirable standards and policies in the administration of health and physical education in the colleges and universities of the United States, and serves as a sequel to a former study dealing only with programs for men. The standards and policies proposed are intended as guides to administrators and other workers in the college field. Some of these practices are already in operation; others may prove undesirable in certain situations; still others may stimulate thought, or suggest an analysis of the strong and weak points in the program and furnish a basis for planned and intelligent improvement.

In the introductory chapter, one finds a brief history of the subject. Excellent discussions on the organization and personnel; health supervision, instruction, and service; and the requirement for physical education in colleges follow. The orientation in physical education for college freshmen receives consideration. Several chapters on the actual program in physical education are laudable. Such topics as the administration of intercollegiate and intramural athletics, the administration of physical education equipment, of swimming pools, and information on the appointments of physical education buildings for colleges and universities are also included in this book.

Copious diagrams, forms, and tables add much to the clarity and to the conciseness which characterize Dr. Hughes' style.

*Administration of Health and Physical Education in Colleges* is undoubtedly *the* textbook in this field for both the experienced administrator, and the professional student. Teachers in every phase of our work will profit by reading it.

ROSS L. ALLEN, DR.P.H.
*Assistant Editor, Journal of Health and Physical Education, and The* RESEARCH QUARTERLY

HOCKEY. S. H. Shoveller and Marjorie Pollard. (New York: Pitman Publishing Corporation, 1936). 136 pp., 51 illus. Price $1.00.

This is the first book on hockey (field hockey in this country) to be written by two authors of different sex, and as the differences in the two sets of rules are pointed out, it should be as useful to men as to women. Men's hockey, of course, is still comparatively in its infancy in this country. The authors are two very famous experts in the world of hockey—both having played for England for many years, and both unsurpassed in skill as forward line players. Shoveller has now retired, but Miss Pollard still continues to pile up goals for the All-England Women's Hockey Team.

Their purpose in writing this book is to help the beginner and the inexperienced, but the good player as well should be able to glean some valuable hints from it.

Although the book is comparatively short, it deals with all the essentials of the game in a very readable fashion. After a brief description of the two hockey associations in England, the authors go on to discuss the right type of equipment to use, the strokes employed in the game, and various other details such as bullying, free hits, dodging, passing, corners, and rolls-in. Then they turn their attention to individual positions, placing special emphasis on their relations one with another, and leading up to a short discussion on general team tactics, with a few suggestions as to individual stick practice.

The authors are, on the whole, refreshingly undidactic in their explanations; their long experience in the game has, no doubt, made them realize how hard it often is to make "cut and dried" statements which hold good on all occasions. Their descriptions on stroke production, however, might have been made a little more specific. Cuts and lunges are dismissed in half a page with a few general remarks. Although most of these strokes are, of course, of little use in the hands of an inexperienced player, yet it seems as if space should have been devoted to some explanation of the left-hand lunge—a much more vital stroke in the average game than the scoop, which has been included. Very little emphasis, also, is laid on wristwork—the very backbone of good ball control. This is a great pity, for many a player's game has suffered through lack of understanding of the right use of the wrists—especially in such strokes as the push and the dribble—and written descriptions might be very helpful in clearing up such mistakes.

Perhaps the most interesting feature of *Hockey* is the way in which it is illustrated. It contains a large number of excellent full-page photographs, taken during the course of various match games, which help to clarify explanations in the text, besides pictures of players demonstrating strokes and fouls. There are, also, a few good diagrams. More of these might have been included with advantage to the reader, particularly in relation to defensive tactics.

The book closes with an appendix containing the rules for men and women. These, it must be remembered, are the English rules which—for women, at any rate—differ to a certain extent from those used in this country. Readers will, no doubt, be glad to learn that a classified index has been included. This adds considerably to the value of the book when needed as a reference.

HILDA V. BURR
*Department of Physical Education for Women, University of Michigan*

GOLF FOR BEGINNING PLAYERS. Jennette A. Stein and Emma F. Waterman. (Published by the authors, 1935) 31 pages, paper, 35 cents.

This pamphlet includes the elemental though necessary information concerning this recreative activity which is rapidly increasing in popularity. Topics

included are layout of the course, standard clubs and their use, forms for playing various clubs and shots, rules and etiquette of the game, and a glossary of technical terms.

The treatment is reasonably complete, and if thoroughly considered, should enable the novice to avoid many of the customary errors.

GEORGE B. AFFLECK,
*Springfield College,*
*Springfield, Mass*

WIDTH-WEIGHT TABLES. Helen B. Pryor, M.D. (Stanford University, California: Stanford University Press, 1936). Single copies, $0.60 (less if bought in quantity).

Whether or not a child or adult is well nourished for his age cannot be correctly determined by height and weight alone. This fact has been recognized by physicians and nurses, by teachers of health education, and by parents for a long, long time. But how else could development of the body be measured?

Dr. Helen B. Pryor set herself the task of solving this weighty problem. "People fall," said she, "into a graded series between the extremes of body build." Some have "slender, thin, fast-growing, and highly metabolizing frameworks," while others are of "broad body build, are stocky and heavier, with a lower basal metabolic rate."

The role that heredity plays is not given due consideration when height alone is thought of in connection with weight and age. "A large bony framework requires large muscles to operate it, while the lighter frame requires less soft tissue," as Dr. Pryor points out.

Now muscles and bones, of course, greatly influence weight. But how can one making the usual height-weight tests determine what the bony structure of a given body is? Dr. Pryor spent many months in experimental work with different types and age groups and finally found an answer to this question.

It was by including in the computations made the bi-iliac diameter or width of the pelvic crest. This is the most permanent measurement of body width. It does not vary with posture or respiration. It is "very reliable in predicting body build during the period of most rapid growth." It clearly shows what type of bony structure a given body is made of and it must be considered *along with* height, weight, and age, if a correct opinion is to be found concerning the nutritional status of an individual; that is, in arriving at a final conclusion in reference to the absence or presence and degree, if present, of either malnutrition or excessive weight.

That this added measurement could be relied upon was proved to Dr. Pryor's satisfaction through data obtained every six months over a period of four years on a given group of one hundred adolescent girls and the same number of adolescent boys. In addition, the relationship between relative width of the body and body weight was found by mathematical analysis of measurements on ten thousand children and young adults. From this collected data width-weight tables "were constructed in such a way as to offer a range of seven *normal* weights for each height and age depending upon the width of the iliac crest."

These tables appear in a fifteen-page booklet which tells exactly how they were arrived at and how to use them. They have also been printed in four groups, on durable cardboard. The first gives width-weight tables for boys, ages one to five and for girls in the same age group; the second covers ages from six to sixteen for girls; the third is for boys six to sixteen; the fourth is for men and for women from seventeen to twenty-four years old. Sliding or spreading calipers have been devised for use in measuring the bi-iliac diameter of children and adults. They are marked in inches to the number of fifteen and in centimeters to 38.

It will doubtless be but a very short time before all those interested in health and physical development will come to feel that no accurate estimates

of nutrition can be made unless and until width-weight as well as height-weight measurements have been computed.

This newer knowledge of the proper estimation of health will revolutionize life for children. It will bring to light the truth about each individual child's nutritional condition. It will release some from the bondage of being forced to eat unwanted and unneeded food while at the same time it may clearly show parents and teachers the advisability of reducing fattening foods for some boys and girls not now considered to be overweight.

BEULAH FRANCE, R.N.
*New York City*

ORTHOPEDICS FOR THE TEACHERS OF CRIPPLED CHILDREN. S. W. Boorstein. (New York: Aidem Publishing Company, 1935), 120 pp.

If teaching handicapped individuals has caused you to ponder whether the work is worth while, read this book as a tonic.

Dr. Adella Smith, director in charge of the Division of Physically Handicapped Children in Public Schools of The City of New York should be congratulated for suggesting that Dr. Boorstein should write this excellent inspirational book dealing with the treatment of crippled children. The book is rich in examples of handicapped individuals who have succeeded in spite of their handicaps. This material is drawn largely from Wurtz's excellent book, "Zerbrecht die Krucken." For those who feel that nature has treated them as stepchildren, a perusal of the names of many individuals who have been severely handicapped by deficiencies and who have succeeded in spite of their handicaps, should make them feel that their lot is not the worst.

Material contained in the book is largely epitomized material taken from other writers but very accurately written. Many of the conditions discussed in the book are rarely seen in school work but a more complete knowledge of these conditions should enable the teacher to better understand the mental attitude and physical limitations, and abnormal psychology of these children when they finally leave the hospital cured or partially cured and enter school. Their adjustment to life and to problems is not an easy task. They need wise guidance.

The technical material will not be new to those who have been doing this type of work and it is hardly well enough developed for those unfamiliar with the work. It is hoped that this book will motivate the reader to learn more about the various cases discussed. The glossary of terms will be very helpful for those who are reading the book without previous experience along this line.

The book should be very helpful to all teachers of normal and atypical individuals in understanding their students and should act as a stimulant for those who are teaching individuals with physical defects. The book would make excellent collateral reading for all students in physical education and teachers in general.

GEORGE T. STAFFORD
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# Life and Sustaining Members

## American Physical Education Association

Whose contributions have largely made possible the publication of the Research Quarterly

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# SPRINGFIELD COLLEGE

Corporate Title
INTERNATIONAL Y.M.C.A. COLLEGE

Springfield, Massachusetts

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## GRADUATE DEPARTMENT (Men—Women)

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### Requirements for Entrance

Christian character; Proven ability as a teacher of experience; Graduation from approved Bachelor's Degree course.

Students from regular Science courses ordinarily require two years.

Students from four-year professional courses may reduce the requirement depending upon the character of their work.

### Requirements for Graduation

Completion of 31 semester hours of work on the graduate level in addition to fulfillment of undergraduate professional requirements. Courses may include:

Special Education Seminar: Covering advanced and original work.

Character Education: Discussions and examination of the literature.

Experimental Physiology: General Survey with selection of individual topic by student.

Educational Physics: Study particularly of Physics in relation to animal mechanics.

Thesis: An experimental study of some essential topic.

Camping and leisure time leadership.

Students in Graduate Division of Summer School for 1934.

Graduate Students during year, 1934-35.

Courses in the undergraduate department during the current year.

GEORGE B. ... ECK, A.M., M.P.E., *Director*

ELMER BERRY, M.P.E., Ed.D., *Chairman Graduate Council*

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